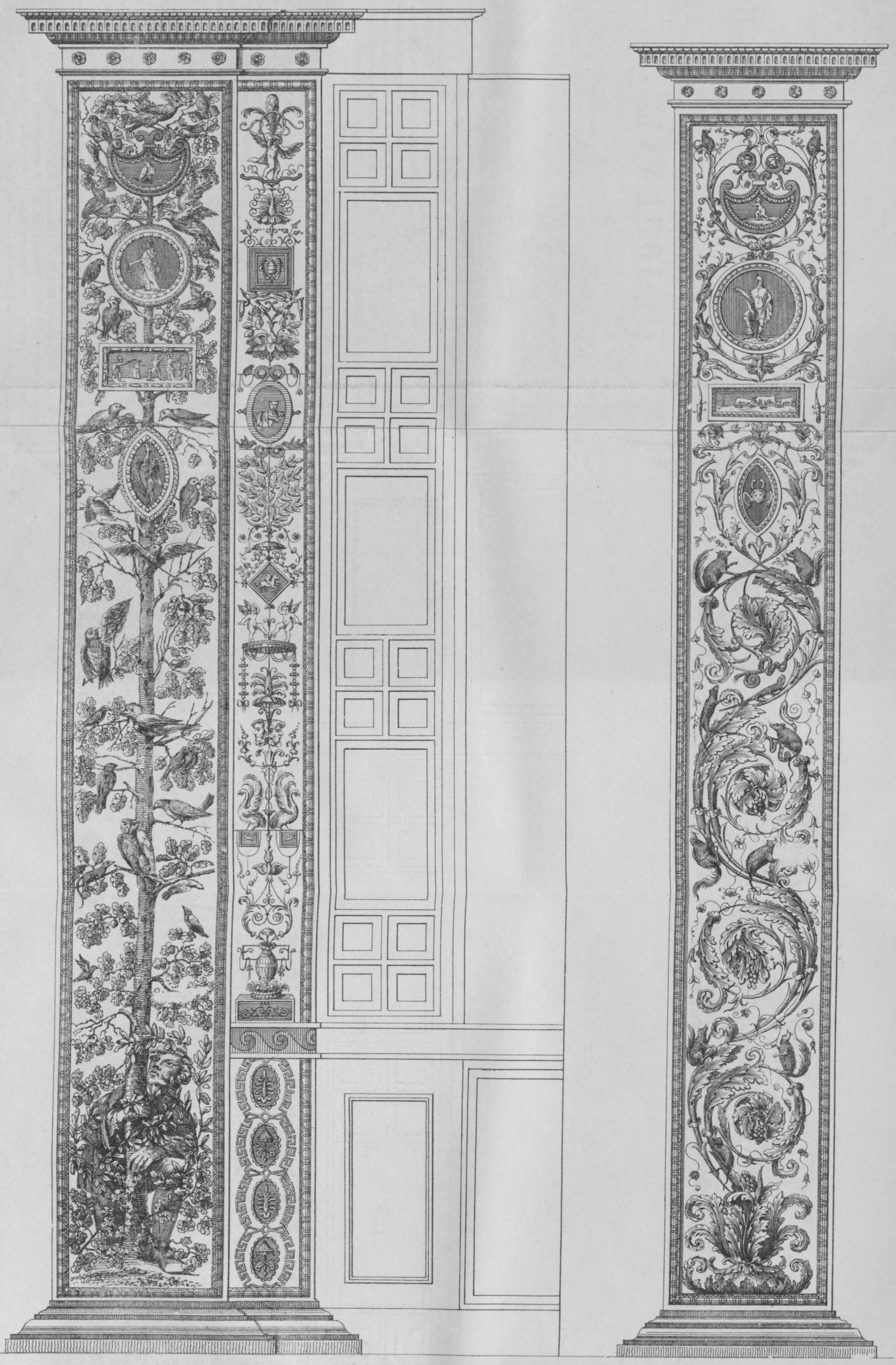
ARABESQUE DECORATIONS OF THE VATICAN AT ROME.



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THE

CIVIL ENGINEER AND ARCHITECT'S JOURNAL.

REMARKS ON ARABESQUE DECORATIONS, AND PARTICULARLY THOSE OF THE VATICAN.

(With an Engraving, Plate I.)

Read at the Institute of British Architects, February 3, 1840.

[At a moment when the public attention is so greatly occupied with the revival of decorations in fresco painting, we have much pleasure in being enabled to lay before our readers, on the commencement of a new volume, the following paper, originally produced at the Institute of British Architects. We regret that we cannot devote a larger number of engravings to the illustration of this essay, which must consequently appear somewhat defective in form.]

It is an observation which has been very frequently repeated and very variously expressed, that the proper use to be made of the study of the ancients in their works of art, is not to copy, but to endeavour to think like them. It is admitted to be of little utility to the artist, to imitate the forms of those beautiful models of decoration, which the Greeks and Romans have bequeathed to us, unless at the same time he qualifies himself to apply them judiciously, and modify them successfully, by investigating the principles from which they originate. Among these principles, none is more important, or has exercised a greater influence in bringing ancient art to perfection, than that which has been so well condensed into one line, that

"True art is Nature to advantage dressed."

and if we wish to rival the ancients in the production of what is at once excellent and original, we must, like them, seek the original types in the works of Nature. This was the source from which they drew the various objects which they have modified and combined, not only in their capitals, their friezes, their vases and their furniture, but also in the apparently capricious and fanciful mixtures of different species of animals, and even of foliage and animals, into harmonious compositions, which delight the eye by their graceful and elegant forms, however repugnant to truth, or incompatible with reason. The motives are to be inquired into which influenced the choice of these objects, and the process investigated, by which they fell into the conventional forms in which alone many, perhaps most of them, are now to be found.

That such a course of study would be analogous to the practice by which the ancients themselves attained so high a reach of perfection, we have sufficient proof. Nothing in art can be imagined more conventional than the orders of architecture; and yet Vitruvius endeavours to derive them all from simple principles, and in the Doric order, we can easily trace the original elements of a primitive mode of construction. We shall not so readily perceive the analogy with the female form, given as the origin of the Ionic. It requires a very great stretch of imagination to refer the volutes to the curls of the hair, or the flutes to the folds of the garment. Whatever be the origin of the Corinthian order, the fable which attributes its invention to Callimachus, is as graceful as the order itself; and its repetition by Vitruvius sufficiently indicates it to have been a received principle, that the most conventional forms (and a more conventional form than the Corinthian capital it would be difficult to point out), were supposed to have been originally suggested by the forms and accidents of nature. The least we are authorized to infer from all these instances is, that in the opinion of the only ancient author on architecture to whom we are able to refer, a motive was to be found in every thing the ancients invented, and that in studying the arts it was indispensable to seek and to understand it.

To follow up the subject of these remarks, would open an extensive field of inquiry. They are offered in the present instance merely as prefatory to a few observations on the arabesque style of decoration, illustrated by a short review of the arabesques in the Loggie of the Vatican. It is proposed to inquire how far the artists who designed and executed these arabesques have been indebted to the antique, and how far they have modified the hints derived from that source, so as to adopt their compositions to the purposes they are destined to fulfil. There will also be occasion to notice the derivation of many conventional forms, and the happy adaptation of natural objects by which these arabesques are enriched in a very extraordinary degree.

In speaking of these sort of compositions as arabesques, the term is of course adopted as it is commonly understood, and it is needless to explain that we disregard both its etymology and meaning in applying it to the paintings and stuccoes of antiquity, which represent not only foliage and fruits, but also beasts of every species, and imaginary creatures combined and interlaced together. These decorations have also acquired the name of grotesques, from the grottoes

or underground buildings in which they have been found—a term we have perverted still more from the sense in which it was invented.

It is remarkable that the only mention Vitruvius makes of this style of decoration, is in reprobation of it—but he describes it so accurately, that the passage is worth repeating, if for no other reason. After pointing out and classifying, what he considers legitimate objects for painting walls, such as architectural compositions, landscapes, gardens, and sea-pieces—the figures of the gods, and subjects drawn from mythology, and the poems of Homer, he proceeds thus—"I know not by what caprice it is, that the rules of the ancients, (observe, that Vitruvius looks up to the ancients in his day, that is to say to the Greeks,) who took truth for the model of their paintings, are no longer followed. Nothing is now painted upon walls but monsters, instead of true and natural objects. Instead of columns we have slender reeds, which support a complication of flimsy stems and leaves twisted into volutes. Temples are supported on candelabra, whence rises, as from a root, foliage on which figures are seated. In another place, we have demi-figures issuing from flowers, some with human faces, others with the heads of beasts, all things which are not, never have been, nor ever can be. Such is the influence of fashion, that either through indolence or caprice, it renders the world blind to the true principles of art. How can it ever be supposed that reeds can uphold a roof, or candelabra a whole building—that slender plants can support a figure, or their stems, roots, or flowers put forth living beings. Yet no one condemns these extravagancies; on the contrary, they are so much admired, that no one cares whether they be possible or not, so much do mankind render themselves incapable of judging what is really deserving of approbation. For my own part, I hold that painting is to be esteemed only so far as it represents the truth. It is not sufficient that objects be well painted; it is also necessary that the design be consonant to reason, and in no respect offensive to good sense." Pliny also laments that in his time, gaudy colouring and quaint forms were held in greater estimation than the real beauties of art. But with all deference be it spoken, there is another side to the question, which these great authorities seem to have overlooked. Conventional decorations of this kind were within the reach of thousands to whom paintings in the higher branches of art were inaccessible, and a more general diffusion of taste must have been at once the cause and effect of their universal adoption—how universal, the remains of Pompeii reveal to us. If we examine the ancient arabesques independently of these prejudices, we shall find endless beauty, variety and originality; graceful details, combined in consistent and ingenious motives and analogies, and great skill and freedom in the mode of execution. We shall also find reason to doubt whether the introduction of the arabesque style really had the effect of discouraging painting of a higher class, since even at Pompeii, poetical compositions of great merit are frequently combined with the lighter groundwork of the general decoration.

However fanciful and capricious the arabesque style may at first sight appear to be, there can be no doubt that it may be treated according to the general fixed principles of art, and that the artist will be more or less successful as he keeps these principles in view. A due balance of the composition is essential, so that the heavier parts may sustain the lighter through every gradation, and there must be such a disposition as not to cover too much or too little of the ground. Unity of design is to be studied in a connexion of the parts with each other, and in the harmony of the details and accessories, which ought as much as possible to tend to some general aim. It adds very greatly to the value of this species of decoration, when it can be made by these means, significant as well as ornamental. It would lead us much too far to enter upon the subject of colour; but it may just be observed, that in the ancient decorative painting, the balance of colour is strictly attended to. Their walls usually exhibit a gradation of dark panels in the lower part, a breadth of the most brilliant colours in the middle and principal division, and a light ground thinly spread with decoration in the upper part and in the ceiling, an arrangement dictated by the natural effects of light and shade, and reflection. As lightness and grace are the peculiar attributes of arabesque, the foliage which forms its most fertile resource should never be overloaded, its details and modes of ramification ought to be drawn from nature. The poems of Schiller and other German authors have lately been published, with a profusion of arabesque decoration in the margin, which are well worthy of attention, both for the ingenuity with which they are rendered illustrative of the text, and for the accuracy, the *botanical* accuracy, with which some of the foliage and flowers are represented, and which forms one of the greatest charms of these clever and original compositions.

Although the paintings in the Loggie of the Vatican pass under the name of Raffaelle, it is not pretended that they are the work of his hand, nor even his designs. He was indeed the originator and director of the whole, and the character and influence of his taste is visibly stamped in every part. But his coadjutors in the work were artists, whose names are inferior to none in the Roman school but his own, such as Giulio Romano, Perino del Vaga, Benvenuto Tisi, and others, who were occupied not only in the execution but in the invention of the details. Francesco Penni and Andrea da Salerno are particularly noticed as being employed for the figures, Giovanni da Udine for the fruits and flowers, and Polydore Caravaggio for the relievos. It may be worth digressing to mention, that M. Quatremere de Quincy is of opinion, that the sculptures of the Parthenon were produced by similar means, Phidias there performing exactly the same part as Raffaelle in the Vatican—and it is indisputable that the combination of unity of design with variety of detail which characterizes Gothic architecture, could have been produced only by the same system, and by employing the minds as well as the hands, of those by whom the decorations were executed. When we see perfection attained in three distinct styles of art, in three distant ages, by means precisely similar, it is not too much to assume that these means are probably the right ones.

The Loggia of Raffaelle, is an arcade in 13 compartments. The arches are open, or at least, were so originally, toward the court, of which the Loggia forms one side. The opposite side is a wall pierced with windows, one in each arch, giving light to the suite of rooms which contains the great frescos of the prince of painters. The ceiling of each compartment forms a square cove, on the sides of which are the panels containing the series of scriptural paintings, the engravings from which are known as Raffaelle's bible. These are his own designs, and some are known to have been touched with his hand. Both the lateral and cross arches are supported by pilasters about 16 feet high, panelled, and decorated with coloured arabesque on a white ground. Each pilaster on the wall side is flanked by a half pilaster, in which the arabesque is carried through on a smaller scale of composition. It is to these pilasters the present remarks will be confined. We shall find in them as much matter as with the collateral observations to which they will give rise, will fully occupy the time at our disposal this evening.

The description of the pilasters will be taken in the order in which Volpato has engraved them; that is to say, beginning on the side next the wall. [1]

No. 1. Notwithstanding the great variety in the composition and details of these works, we shall find a general unity of design prevailing throughout, with the exception of the last five of the series, which will be particularly noticed in their turn. Whatever form the composition may take, it is rendered subservient to the introduction of four medallions, or tablets, relieved from the back ground in stucco, of contrasted shapes—one like an antique shield—the next circular—the third rectangular, and the fourth in the form known as the *vesica piscis*. These medallions occupy the upper part of the pilaster, to the extent of about one third of the whole panel, while the lower part, to the height of the dado, or somewhat higher, is generally filled in such a manner as to afford a *weight of colour*, sufficient to support itself by the side of that member of the architecture, and the members introduced into its panels, following in this respect the practice of the ancients. These medallions might appear to vio-

[1] We must refer the reader to Volpato's engravings, which were exhibited when this paper was read. They are easy of access.

late the due balance of the arabesques, if they were identified with them; but the composition is rescued from that fault, by the separate character given to the decoration of the medallions, and by their being detached, and hung as it were, independently upon the background. In the general arrangement of the whole, these medallions perform a very important part, connecting the pilasters with the panelled stuccos adjoining, both by their relief, and by means of an accordant style of decoration and a similarity in the subjects represented upon them, neither of which could have been well embodied in the arabesque itself. (see Plate I, Fig. 1.)

It must be admitted, that these compositions considered separately, are somewhat unequal, and the examples to be first passed in review are by no means the best; but instruction may be derived from a consideration of their defects. There are in this pilaster, (No. 1,) many graceful details, but the effect is less pleasing and satisfactory than in some others where there is a greater unity of composition, and where the objects are less varied and numerous; moreover, too many of the forms in this example are somewhat stiff. The guillochi which occupies the lower part of the half pilaster, is extremely rich; and we shall find throughout the series, that this part of the composition bears a solid and architectural character, in conformity with the principle which has already been adverted to. Upon the stuccos it is not my intention to dilate; I would merely draw your attention to the beautiful simplicity of the panelling. The antique figures which fill the compartments would require a separate dissertation to describe them only. They harmonize, as before observed, with the subjects contained in the medallions. The clusters of natural fruit and foliage

Fig. 3.

which surround the windows are continued throughout the series of arches, and are greatly varied in detail, though precisely similar in composition. There is nothing conventional in these festoons—the clusters are simply connected together by a string, and are composed of the most familiar objects rendered with perfect truth. (Fig. 3.) The melon, the orange, the chesnut, the tomata, the olive, grapes of different kinds, pomegranates, gourds of every description, pine and cypress cones, are those which most frequently recur, with their foliage and blossoms. The artist has not even disdained the cabbage, the cucumber, and the onion.

No. 2, has the same faults as the first. The frame, with the horse, saddled and bridled, is quite in the spirit of the antique decorations, but it divides the pilaster disagreeably, and is not a proper subject to occupy the principal place in the composition. In the side pilaster we have a rather thin and wiry scroll, of which both the foliage and flowers are conventional, but the convolvulus major twines beautifully and naturally over the fret below.

In No. 3, a closely woven festoon of foliage and flowers is formed into panels—not, I think, very happily, since the arrangement is such as the eye does not very readily comprehend, and even if it were more simple, it would scarcely be applicable, since it divides into many distinct parts the panel which is in itself a single feature of the general design; its integrity is therefore destroyed by this mode of decoration. The subjects which occupy the panels are, however, well worthy of attention. The group of deer, the landscape, the dog chasing a porcupine, the Cupid on the dolphin, and the two winged children manœuvring a dancing bear, are all in the true spirit of the antique. The single figures are less so; an ancient painter would not have placed them on a scrap of earth. In the Pompeian decorations, the detached figures—I do not speak of such as are inclosed in frames, but the *detached* figures—partake of the artificial character of the style to which they are adopted, and if they are not represented as floating in the air, they stand upon a bracket, or a mere line, or on anything but the natural ground. In the panels of the stucco are male and female chimeras, enveloped in a scroll formed of the natural branches of the briar rose.

In No. 4, we arrive at a greater unity in the design, for though it consists of many parts, yet they all bear upon each other, and are mutually connected throughout. The temple which forms the centre of the composition is altogether in the style of architecture which holds so important a place in the arabesques of the baths of Titus and Pompeii. I call it *a style of architecture*, for in the ancient paintings, where it generally forms the framework of the composition, and contributes greatly to that unity of design which distinguishes the ancient arabesque, it assumes a regularity and consistency which fairly entitle it to the appellation of *a style*. The supporting figures are objectionable, for they are in motion—common walking motion. Much more objectionable are the terminal figures which rise from the acroteria of the temple.

My objection to these terminal figures is, that they are improbable. Improbable, I mean, upon certain postulates, which it is necessary to assume before we can reason upon these imaginary compositions at all. The mythology of the ancients has peopled the elements with beings compounded of the human and brute creation, their intelligence being indicated by the first, and their fitness for the region they are supposed to inhabit by the second. There is nothing in ancient art, in which greater taste or judgment is displayed, than in some of these combinations. The animal functions appear in no wise compromised by the mere interchange of corporeal members, between different species. Such combinations, therefore, as long as they involve no glaring disproportions, present nothing repugnant to the mind; and we are so familiarized to them, that we pronounce upon the success of the representation of a triton, a satyr, or a centaur, with as little hesitation as we might upon that of any of the animals of which they are compounded. We are equally ready, or perhaps owing to a stronger association of ideas, *more* ready, to admit of aerial beings, supporting themselves on wings, floating in the ether, or alighting upon a flower without bending the stalk, though these

are, in fact, less probable than those born of the ocean or the earth. Between animal and vegetable life there is also a sufficient analogy to attach some probability, or at least to afford an apology, for the graceful combinations between these two kingdoms of nature, invented by the ancients, and adopted to a very great extent in the compositions before us; but, when we come to combine animal life with unorganized matter, the probability ceases; and if, as in the case before us, the unorganized portion is something artificial, and totally out of proportion besides, the combination becomes intolerable. Thus we acquiesce in the metamorphoses of Ovid or the Arabian Nights, as long as certain analogies are observed; but the transformation of the ships of Eneas into sea nymphs, is, as one of our greatest critics has observed, a violation of probability to which nothing can reconcile us.

No conventional form has been more abused than the terminus. Intelligence and immobility are the attributes which the ancients intended it to embody, but their apposite creation is totally different from anomalous compositions like this, into which it has been tortured.

The scroll in the half pilaster of this example is greatly superior to that in No. 2. It is more simple in its composition, and the leaves are broad and natural, and fill the space much more satisfactorily than a multiplicity of wiry lines and flimsy objects, producing confusion, and destructive of breadth of effect.

In No. 5, we arrive at a superior composition; for it must be repeated, we are examining the decoration of a single member of an extensive *whole*, and that however beautiful each may be, unity is a beauty in addition. No object in decoration has been so extensively used as the scroll. The ancients do not appear to have been afflicted with an unhappy craving for novelties, nor to have been haunted with the apprehension that beautiful forms of composition would become less beautiful by repetition. When the most appropriate forms in architecture and decoration were once ascertained, they were continually repeated, but marked with a fresh character, and stamped with originality by those refined and delicate touches which were all-sufficient when they were properly appreciated. We need only refer to the temples of the ancients, to see how pertinaciously they adhered to an established principle, and to the varieties in the proportions of the Doric order, or the character of the Corinthian capital, varieties which we may be assured were neither capricious nor accidental, to see how studiously they availed themselves of all the resources of art in its details. In the same manner with regard to the ever-recurring form of the scroll, as long as the foliage and ramifications of nature are unexhausted, so long will it be capable of assuming an original character in the hands of the skilful artist. A striking illustration of this position may be drawn from the arabesques in the palace of Caprarola, where the pilasters of the Loggie are decorated with scrolls, all similar in composition, but each formed of a different species of natural foliage, without the intermixture of anything conventional, except the regularity of the convolutions. I regret that I can show but three of these beautiful scrolls, and those very slightly represented. They are composed of the olive, (Fig. 4,) the vine, (Fig. 5,) and the convolvulus, (Fig. 6.) The latter being rather thin in proportion to the others, is enriched with birds.

Fig. 4.

Fig. 5.

Fig 6.

For the magnificent scroll before us we are indebted to the antique. It is an imitation of the well known marble in the Villa Medici, but the artist has made it his own by the skill with which he has adapted it to his purpose both in proportion and colour (see Plate I, Fig. 2.) I would particularly call your attention to the animals, the squirrels, the mice, the lizards, the snake, the grasshopper, and the snail, dispersed about the branches, so well calculated to fill the spaces they occupy, and at the same time producing a variety which would have been wanting, had the foliage only been extended with that object. To the scroll in the half pilaster, it is to be objected, that it is a repetition in small, of that in the principal compartment; but if examined separately, it will be found full of instruction, from the union it displays of natural objects with conventional forms. The spiral line of the antique scroll, is evidently drawn from the natural course of climbing plants. It is conventional in its openness and regularity. The involucra of plants furnish the hint for the base from which the antique scroll is made to spring, and the spathes of the liliaceous tribe for the sheaths, of a conventional repetition of which, the ancient sculptured scrolls principally consist. Thus far for the general elements of the antique scroll, which the artist has implicitly followed in the example before us; but he has enriched his composition without disturbing its unity, by making every sheath produce a different branch, drawn immediately from nature. The birds present an equal variety, and are occupied according to their natural habits, in feeding on the berries and buds, or on the variety of insects which are also introduced. The arabesques in the side panels are to be particularly noticed in this example. A *motivo*, however slight, is always to be desired, and here we see a very graceful one, in the two winged boys, who dip into a vase-like fountain. The winged bear,

which occupies the medallion, may be noticed, as a violation of probability. A being to cleave the air, should not be selected from the most heavy and awkward of animals. It is undoubtedly intended for a *jeu d'esprit*, and is quite in the spirit of the antique. The ancient frescos are full of such whimsical combinations, but always, as in the present instance, occupying a subordinate place.

No. 6 is worthy of an attentive examination; the lower part is extremely fanciful, and well adapted to its purpose. For his principal object the artist has chosen the Diana of Ephesus, with her attributes, forming, with some arbitrary decorations, a remarkably well balanced composition, of which the rectilinear shapes contrast in the happiest manner with the flowing lines above. The Diana constitutes a foreground, behind which rises a slender tree. There is nothing more graceful throughout the whole series than the branches of this tree, and the winged boys who sport among them and enjoy the fruit. (Fig. 7.) Equally graceful are those who gather barley from the Cornucopia, and grapes from the loaded trellis above.

Fig. 7.

No. 7 is one of the most remarkable of the series. In this the artist has ventured, and with the most perfect success, to discard every thing conventional, and to represent a natural tree, balancing its irregularities of ramification and foliage by the numerous birds which occupy the branches, where they may be supposed to have been collected by the call of the bird-catcher, who is concealed in the underwood with his bird-call in his mouth. (See Plate I, Fig. 1.) One bird, fettered by a limed twig, is about to fall into his hands. It is impossible to admire too much the skill with which this simple *motivo* is worked out. The arabesque of the side pilaster is one of the best of this order; all the parts are graceful in themselves, and well balanced, both in form and colour. This composition is also to be remarked for the introduction of some of the heraldic insignia of the holy see. The keys in saltire, the umbrella, the papal tiara, and the fisherman's ring, with which the successors of St. Peter are invested. I am rather surprised that this sort of allusion has not been more liberally used.

No. 8 is perhaps the least pleasing of the series. There is a total want of unity in the composition, which is merely a repetition of similar designs, and these not a little stiff and formal. There is likewise too great a weight, both of form and colour, toward the top; but the scroll in the half pilaster is beautiful, and closely resembles that in No. 4.

It will be unnecessary to dwell upon No. 9, since it is precisely the same in general character as No. 5, though varied in its details, in the disposition of the animals, and the mode of spreading the lighter ramifications at the top.

No. 10 bears nearly the same relation to No. 4, upon which we have already remarked at some length. It may be further observed in reference to Nos. 4 and 10, that folds of drapery are too broad and heavy to be successful in arabesque, its effect is seldom pleasing. I must also protest against the birds which crown this composition. Nature has provided a variety which makes it quite unnecessary to seek novelty by combining the neck of one species and the tail of another with imaginary wings. The first impression is that these birds are meant for swans; the second, and abiding one, that the artist did not know how to draw a swan—he has not mended them by dressing them in trousers. The scroll in the half pilaster is composed in the same manner as in No. 5, but is better filled.

The next example may be considered a *pendant* to No. 7, which, however, it by no means equals. The stem is a natural reed, each joint conventionally expanded into a calix, from every one of which sprouts a branch of a different species; here are the wild celery, the rose, the blackberry, the arundo, the privet, the grape, the olive, and the barley. The panthers in the stucco panels are appropriately combined with the ivy and grape.

Of the more varied and fanciful compositions on this side of the Loggia, No. 12 is one of the best. It wants unity, and the introduction of so dull a reality as a curtain in the midst of so many objects of pure fancy is displeasing; neither can I reconcile myself to the termini in the upper part. Independently of other objections, they are too essentially terrestrial to enter into combination with these light sprays—an aerial terminus is a contradiction. They are, however, well treated when compared with those in No. 4. The separate parts of this composition are greatly to be admired, especially the *motivo* of the lower part, and the unity which pervades the fanciful combination above it.

No. 13 is in the same style, but much superior. Taking the lower half as complete in itself, nothing can be more gracefully designed, or more perfectly balanced, which latter is, perhaps, after all, the most important point in the composition of arabesques; they will certainly be found more or less pleasing on a first impression, as this condition is more or less perfectly fulfilled. The solidity of the base, the breadth of the parts forming the next step, the lightness of the Pompeian architecture above, and the fluttering character of the objects which surmount it, constitute a gradation which satisfies the eye, while the variety of detail fills the imagination. The upper parts of both these examples abound too much in trivial and wiry details, such as ribbons and strings of jewellery, which are introduced to convey the idea of excessive lightness, but have rather a contrary effect, by producing confusion, and are also too artificial to harmonize with the general character of the composition.

The last on this side repeats No. 3 in the principal composition, and No. 10 in the half pilaster, and therefore requires no observation.

The twelve compositions which occupy the piers on the open side of the Loggia, differ remarkably from the 14 which have been described, and a perfect unity of design distinguishes the majority. This was, perhaps, the more easily accomplished, since (the architecture necessarily differing from that on the side next the wall) the dado is continued across the pilaster, and forms a separate series of panels, each of which is filled with a natural or imaginary being, adapted to the element of water. The half pilasters are also omitted on this side, and a greater breadth of design given to the stuccoes which are brought into immediate contact with the larger arabesque.

In No. 15, the artist has chosen the apparently incongruous subject of fish to combine with his foliage. In a painting by Hogarth we see in the fashionable furniture of one of his scenes, a composition of foliage inhabited by fish instead of birds, and though this absurdity be intended as a caricature of the taste of his day, it is no great exaggeration of the fact. In this design, the foliage and the fish are brought together without the slightest violation of probability; the fish have been hung to the branches; the variety of their forms and colours produce an admirable effect, and above all, they are perfect in the condition, more especially indispensable in objects not intrinsically graceful or pleasing, of being represented with the most absolute truth to nature. We have the haddock, the lobster, the dory, the cuttle-fish, the whelk, the perch, the shrimp, the crab, the gorbill, the muscle, the cockle, the mullet, and the anchovy. This example may teach us that objects for decoration may be sought throughout the whole range of Nature's works with hopes of success.

A more graceful conception than the double scroll which forms the subject of No. 16 it is difficult to imagine. It combines unity of design with an unexceptionable balance of parts, and the most perfect lightness devoid of any thing trivial. This composition might be considered absolutely faultless, were not the two figures placed within the scroll rather too small to bear a proportion to some analogous forms, combined with other parts.

Of No. 17 it can hardly be said the effect is pleasing; but both the *motivo* and the grouping of the musical instruments are greatly to be admired, as well as the skill with which the ends of the ribbon are made to fill up and balance the composition, which is well worthy of study, as showing how advantageously familiar artificial objects may

be employed in decoration, when used in their proper place, and not discordantly associated.

Unity is again lost sight of in the design No. 18, but the different objects which compose it, are harmonized upon a totally different principle from any which have been hitherto examined, and the effect is rather dependent upon colour than on form. The panels contrast brilliantly with the white background, and are relieved and rescued from heaviness by the sharp dark lines which surround them; this is quite antique. The component parts of the upper portion of this pilaster must not be passed over unnoticed:—the Cupid and Psyche, the lions with their cubs, the Satyrs grouped with the lower medallion, and the scroll work, which is entirely free from the trivial and confused appendages of which there is reason to complain in some of the former examples.

The general design of No. 19 is the same as in the last example, but its development is scarcely equal, except in the subjects which fill the panels, which are in the highest degree classical and elegant. I ought, perhaps, to have noticed the Tritons, male and female, which occupy the dado of the three last pilasters, but I cannot pass over the bird introduced into this; we are not only presented with the form of the creature, but the skeleton of the fish in its claw indicates its habits also, with the most scrupulous attention to nature; equally true are the bull-rushes in the back grounds.

No. 20 appears to me inferior to any other on this side. The lower part is good, but misapplied, every portion being too minute for its place in the general design. The observation on the drapery need not be repeated. The upper part, besides containing too many trivial and wiry forms, exhibits two or three objectionable matters of detail which it will be proper to point out. The swaddled children are equally unpleasing to the eye and the imagination, and are therefore improper objects for decoration; the heads are also objectionable. To masks there can be no objection—we are familiar with them as a decoration of the ancient theatre; the association does not desert us, though neither the mask nor the manner of its application may have any thing in common with its origin, and though it may be coloured to the life, it is but a mask. But if a bust be introduced, unless it be represented as a sculptured bust, it suggests the idea of mutilation, or what is still more degrading to its character, a coloured wig-block. And even if the heads could be tolerated, nothing can be more ungraceful than holding the festoon in the mouth. Again, in reference to these cornucopiæ (to say nothing of their being ill proportioned and badly drawn), the blossoms and foliage which issue from them are attached at the other end to the scroll above, so that we are in doubt to which member of the composition it belongs, or rather, we see that it confusedly belongs to both. On the sort of termini which finish this arabesque, enough has already been said.

Fig 8.

The remainder of these compositions are of a different character from any that have preceded them, their basis being more architectural, and suited to be the framework of a series of figures which, in the five last examples, reach to a much higher order of art than mere decoration. The lower part of the design No. 21, is in itself beautiful, independently of the figures combined with it, which in composition and drawing, are truly worthy of the Roman school. They do not appear to form any connected subject, like the rest which follow, but the *by-play*, if it may be called so, by which they are united, greatly adds to their value. The attitude of these lower figures, so perfectly adapted to the place they occupy, has its motive in their retreat from the monkies by whom they are threatened, and the monkies are held carelessly by the figures above who are occupied in imitating with looking glasses the dragons, whose undulating forms so gracefully supply the lighter materials of the composition. The medallions which have hitherto accompanied us, are laid aside in this and the remaining pilasters. (Fig. 8.)

Fig. 9.

No. 22 is the first of these connected designs to which I have adverted. In these groups we have the four seasons embodied in personifications truly Raffaelesque:—Spring distinguished as the pairing season—Summer by a group loaded with ripe grain, and the fruits of the season spread at their feet—Autumn by the vintage, represented with a grace and fancy which it is difficult to find words to characterize adequately, (Fig. 9,) and Winter by a composition well calculated as a base for the pyramid which rises from it. To point out the beauties of this painting as regards decoration, is to take a very narrow view of its merits; every one of the 14 figures it contains might be studied as an example of all that is great and graceful in the Roman school of art.

No. 23 also is not more remarkable for the skill with which the parts are combined, than for their separate excellence. The niches and superstructure, supported by caryatic figures, serve as a basis for the three fates drawing the thread of human life. Observe well the pertinency of all the attributes:—the respective ages of the three females, the opening blossoms which surround the first, the ripened fruit which accompanies the second, and the monumental character of the niche in which the third is placed, with the human emblem of mortality at her feet; and to descend to the lower compartment, we have again to admire the perfect attention to nature in the bird, and the berry-bearing plant in which it is feasting.

The next compartment (No. 24), is also full of a moral intention. The principal figures are emblematical of the flight of time. The horary dial supports an admirable group of day and night, with their emblems, dominated by the personifications of the sun and moon; they are accompanied by the well known emblems of time and eternity, and we may find much meaning, even in the steel yard, classically weighted with heads of Janus regarding the past and the future. None of the series is more elegantly terminated than this, though the group does not appear to have any immediate relation to the main subject.

Nothing can be in a higher style of art, than the personifications of Faith, Hope, and Charity in No. 25. To enlarge upon their individual excellence would be foreign to the present purpose. I must only draw your attention to the manner in which they are made subservient to the general design of filling the space they are intended to decorate, and the spire-like form in which they are made to rise from the heavy to the light.

The last compartment is dedicated to the sciences of geography and astronomy. The terrestrial and celestial globes, borne by the genius below, each support figures emblematical of that part of the universe which they represent. On the one lies the earth-born Antæus at the feet of Hercules, who is represented in his appropriate labour of supporting the heavens, while a winged being of celestial aspect crowns the other.

Having now completed the review of this series of arabesques, it is not my intention to detain you by any lengthened observations upon them, such as occurred having been expressed on the immediate occasions on which they arose. I began by stating the principles which I conceived might be illustrated by this review and in con-

clusion, I venture to suggest the examination and study of arabesque composition as practised by the ancients and the moderns—a comparison of the Baths of Titus, and the remains of Pompeii and Herculaneum, with the Loggia of Raffaelle, the Villa Madama and the Palazzo T, as one of the most instructive lessons that can be devised, upon the varied and original results that may be derived from the same materials, according to the different lights in which they are viewed, the different modes in which they are studied, and the different purposes to which they are applied. In the resources which the decorative artist can call to his aid, the moderns have greatly the advantage over the ancients, since we possess their materials and our own also. For as long as ancient authors are read, and ancient art appreciated, so long will allusion to the manners, customs, poetry, and religion of antiquity be familiar to us, and the symbols to which they gave rise be universally understood; indeed numberless allusions of this kind are constantly before us, and are so familiar that we forget to inquire their origin. In personification, and the embodying of abstract ideas, the field is as open to us as to them, and we see to what advantage it may be turned by the examples we have just passed in review; and if we add to all these objects those derived from the useful arts and sciences which may be turned to account in the hands of the skilful decorator, his resources may be considered boundless. For as we have seen in these examples, it is not the familiar aspect of any object which should banish its representation from works of fancy. Every thing depends upon its proper application. The ancients made the best use of whatever they considered most appropriate, and we must endeavour to do the same. Thus, on the pedestal of the Column in the Place Vendôme, a professed imitation of that of Trajan, modern arms and habiliments occupy the place of those of the Roman period sculptured on the original. Whether this translation be as well executed as it might be, is not now the question. It is noticed merely as being right in principle. One fertile source we have, totally unknown to the ancients, from which materials may be drawn for decoration, carrying with them the invaluable quality of being in all cases significant as well as ornamental—I mean the science of heraldry. I cannot help thinking that the Greeks, who used so much diversity of colour in their architecture, would have availed themselves liberally of the tints of heraldry in their decorations, had they been acquainted with it. From the personal allusions it conveys, it might be made a much more important feature than it even now is, in the decoration of private as well as public buildings, and we have only to study the works of the middle ages for invaluable hints on the mode in which it may be applied. The mere display of shields of arms is but one mode. We shall find heraldry intimately woven into the ornaments of our Gothic buildings, and he who can read its language, may often understand an allusion in what may appear, at first sight, a mere decoration. Thus, one of the mouldings of the tomb of Humphrey, Duke of Glocester, at St. Albans, is filled with an ornament, which, on examination, resolves itself into a cup containing flowers, a device assumed by that Prince, says a MS. in the college of Amis, "as a mark of his love for learning." Heraldry has not been neglected in modern Italian art, and a very well imagined arabesque may be seen at the town hall at Foligno, where the ceiling is covered with foliage spreading from the centre, on the ramifications of which are hung the shields of the nobility of Foligno for many generations. And at Macerata there is a church decorated in a very peculiar style, bearing throughout an allusion to the name of the founder.

A. P.

POMPEII.—The *Frankfort Journal* of the 10th November, states, that the last excavations made in the Street of Pompeii brought to light a number of paintings in fresco, which were affixed as an ornament to four adjoining houses. One of those paintings was remarkable for the extreme correctness of the design, and for the freshness of the colouring. The subject of this painting is Bacchus and a faun pressing grapes, which are borne by a young slave, whilst a child is pouring the wine into a vessel fixed in the earth.

BUILDINGS IN BELGIUM.

By GEORGE GODWIN, JUN., F.R.S., &c.

"Perhaps no study reveals to us more forcibly the social condition and true feeling of passed generations than that of their monuments."—M. GUIZOT.

Chapter I.

BELGIUM contains a multitude of interesting examples of architectural skill in the middle ages, eminently worthy of careful study, and sufficient, from the diversity of the epochs they mark and the character they bear, to illustrate fully a history of the rise and progress of Gothic architecture, and the re-birth of Italian art. An essay on the architecture of Belgium, its peculiarities, its gradual alteration, and its connexion with the architecture of other countries, would be a valuable work, and, so far as I know, is yet to be done, notwithstanding that most of her chief buildings are almost universally known. The present memoranda consist simply of the jottings made during a brief visit to the country in question, and are published with the feeling which has in other cases led the writer to take the same course, namely, that if every one will bring a stone, you may soon raise a pyramid.

The domestic architecture of Belgium offers an infinite variety, and affords numerous hints for present application. Within a very small circle, in some cases even in a single city, examples may be found of the different styles of building which have prevailed at intervals, say of fifty years, from the 11th or 12th century up to the present time. Such towns are a book which those who run may read, and afford a great amount of pleasure and information to those who will pause to think. At Tournay, a most interesting old town, close to the French frontier, towards the western extremity of Belgium, (and of which I shall hereafter speak again,) there are several exceedingly ancient houses; one of an interesting character is situated near the church of St. Brixe. The whole is of stone, and terminates in a gable. The windows, about 5 feet high and 4 feet wide, are each divided into two openings by a small column with plain leafed capital. One of the lower windows has simply a rectangular mullion down the centre, the edges of which are chamfered to within a certain distance from the top and bottom. The string courses, consisting simply of a square member and a hollow, continue through the whole front, and form straight window heads, over which are introduced discharging arches. The adjoining front is precisely similar. In the Rue des Jesuits there are some houses of the same character, but of a somewhat more advanced period. The columns and caps are nearly the same as those before mentioned, and the upper part, perhaps 50 or 60 feet in extent, consists wholly of windows and small piers alternately.

Ghent and Malines display similarly ancient houses.

An early advance upon this arrangement would probably be the introduction of a transom to divide the windows into four, and so to form a *croisée*. In the gable of an old house at Ghent, near the Hotel de Ville, appears a large pointed window, quite ecclesiastical in aspect, with mullions, traceried head, and label. A house near the Grand Place at Tournay affords a very perfect example of the application of pointed architecture to a street front, at the beginning of the 16th century, and the Hotel d'Egmont at Ghent, shows another application of the same style at a period when it was beginning to exhibit symptoms of decline; as also on a much more elaborate scale, does the well known *Maison des Franc Bateliers* in the same city.[1]

Near the Eglise de Château at Tournay is a large building, now the Horse Infirmary for the artillery, which would seem to be an example at a later stage of the decline. It is constructed of red brick and stone, and presents gables, pointed headed windows, other square windows divided by mullions, and large dormers in the roof. The mouldings, however, are Italianized, the discharging arches, partly stone and partly brick, which occur even over the pointed headed openings, are made into adornments, and all the ornaments which appear are of mixed design. Later still, the line of the gable became altered into

[1] Mr. Donaldson has made a very interesting series of sketches to illustrate the gradual progression here only hinted at.

a scroll, the mullions of the windows disappeared, and the Gothic panelling on the face of the building gave place to pilasters and entablatures elaborately adorned with figures, fruit, and foliage, as may be seen in numberless examples remaining in most of the towns.[2] The Town Halls and Belfries form a striking feature in Belgium, and in some cases are singularly beautiful. Amongst the privileges granted to the towns when they first acquired communal rights, none seem to have been deemed greater, or were more speedily acted upon, than the right of building a belfry to call together the citizens, and a hall as a general meeting place.

The Hall at Louvain, which has afforded a subject to so many of our artists, is now unquestionably one of the most perfect specimens of a civic building raised by the medieval architects, which remains to us. The whole of it, a pile of crocketted canopies, corbels sculptured into numberless figures, windows, panelling, and elegant turrets, has been restored in a very able manner.

The Town Halls of Bruges, Audenaerde, Ghent, and Brussels, are other examples of great interest. The spire of the latter, which is remarkable for its lightness and elegance, is now being restored, and I cannot avoid making this an opportunity to remark, that the desire to restore the buildings left us by our fathers, which is, at this time, developing itself simultaneously in England, France, Germany and Belgium, is no unimportant sign, and will serve hereafter to characterize the 19th century. Valuable as the result is, the feelings which prompt to it, and of which it is but the evidence, are more important still.

The west front of St. Gudule at Brussels, the cathedral at Antwerp, and St. Bavon at Ghent, are amongst the principal buildings in Belgium, which have been lately repaired. More important perhaps than any, however, are the restorations now going on at the cathedral of Tournay, which is one of the most interesting structures in the country, whether regarded *per se* as a specimen of the architectural skill of two different periods of time, or as recalling by association the events of many ages.

Seen from a distance, with its forest of towers high above the surrounding buildings, its effect is very striking; nor are the pleasant anticipations so raised in any degree lessened by a close approach. In form, it is a Latin cross, with five towers; namely, one on the east, and one on the west side, at each end of the transept, and one at the centre of the cross. The transept is terminated at each end by a semi-circular absis, similar to many churches in Cologne and other parts of Germany. The nave has an aile on each side, separated by piers and small columns bearing semi-circular arches, which in various parts approach the horse-shoe form.[3] Above these, is a second range of piers and arches, of similar or greater height than the first, forming the front of a large gallery, extending the width of the ailes.[4] Over these, is a series of arches against the wall, springing from short piers. The clerestory and the vaulted ceiling were the work of barbarous repairers, in 1777, and took the place of the ancient wooden roof: they will shortly be restored to their original appearance.[5]

All the capitals of the lower columns in the nave are sculptured to represent foliage, and are exceedingly sharp and clear. In earlier times, they were all painted and gilt, and further decorated by scripture mottoes around the abacus. Much of the stone-work is rough and has been covered with stucco: the columns and other parts that were exposed, are of Tournay stone polished.

[2] Lille, a French town, but close to the Belgic frontier, displays a great number of houses of this character, of great richness, and in some cases, much beauty.

[3] The piers occupy a square of six feet on the plan, set diagonally. The openings are 13 feet 6 inches wide, and about 11 feet 6 inches high to the springing of the arch. There are nine such compartments on each side of the nave.

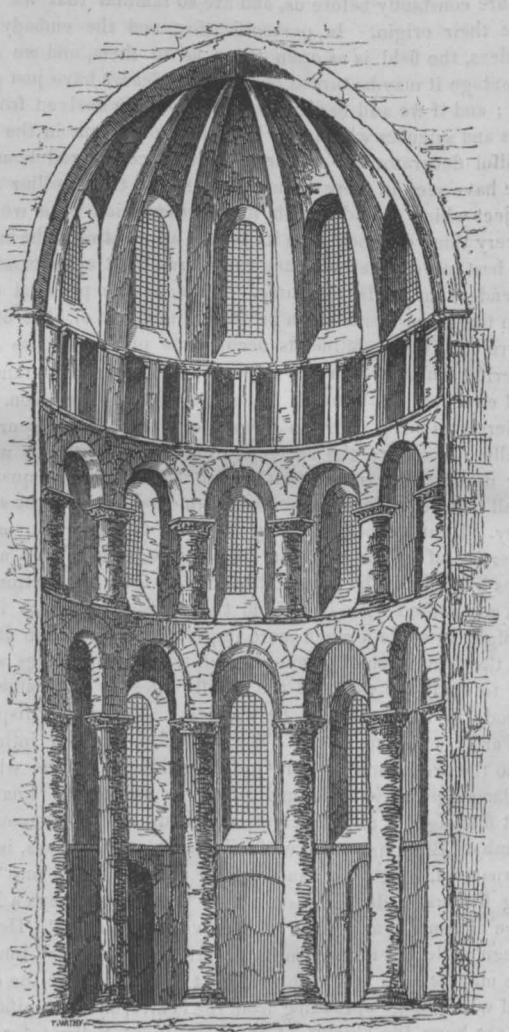
[4] The galleries in ancient churches were used for the purpose of separating the sexes, and even different ages of the same sex. This was perhaps rendered necessary by the custom of *saluting*, which then obtained amongst the "faithful."

[5] During the whole of the 18th century continued injury was done to the building, by injudicious endeavours to support the fabric; many openings, especially in the transept and the clerestory of the choir were bricked up; the capitals of the columns and other decorative portions were covered with whitewash, and the frescoes which adorned the walls destroyed.

The four great arches at the junction of the cross are pointed, and have also been embellished by colour, much of which is still visible.

The interior of the semi-circular absis, terminating the transept at either end, is exceedingly beautiful, and produces a very striking effect. The annexed sketch, (Fig. 1,) may serve to give some general idea of its arrangement. At the bottom, a series of six lofty columns two feet eight inches diameter, and about 24 feet high, built up of ten courses of stone, and placed at a short distance from the wall of the absis, support narrow semi-circular arches raised on legs. Over these are two triforia and a clerestory, and the whole terminates in a half dome with plain ribs converging to a point.[6] The capitals of the columns consist of volutes and of leaves. The base of each pillar has four sculptured leaves at the angles of the pedestal.

Fig. 1.



Originally the choir was about one-third the length of the building, and terminated in an absis similar to those of the transept in form and style. This portion of the building, however, was rebuilt, as is mentioned hereafter, and is now an exceedingly fine specimen of the pointed style, resembling in some respects the choir of Cologne cathedral, although executed much before that wonderful building.

The present choir has an aile and a series of small chapels on both sides, which continue round the east end. Lofty columns bearing acutely pointed arches, separate the ailes from the choir. In each spandril of these arches is a circular ornament in mosaic work, and

[6] These vaults are formed of rubble work, under a wooden roof, and are less than two feet in thickness.

above rise a very elegant triforium and lofty clerestory. Behind the triforium is a series of peculiar quatrefoil lights, blocked up and unknown until lately (as indeed was the whole of the triforium), but now again filled with stained glass.

The choir is elevated above the nave by three steps, for about one-third its extent, and then by a fourth the remainder of the length, and is paved with black and white marble in squares. The high altar has four additional steps. The pillars in the choir were originally constructed with that daring which characterizes many of the earlier efforts of pointed architecture, and soon gave symptoms of insufficiency. They were then strengthened by additional masonry at the back, and even now are remarkable for their lightness and elegance. It may be mentioned, that when the choir was rebuilt, the old chancel arch which was probably semi-circular, was cut away to make room for a pointed arch; as also was the case at the entrance from the transept to the aisle of the choir on each side. Painting and gilding have been used throughout as a means of decoration, and will probably be again resorted to when the whole of the substantial repairs have been executed.[7] A series of flying buttresses (seen in the sketch, at the head of the second chapter), surround the choir externally, and it is between these that the chapels are formed, terminating in gables.[8] The roof of the choir above the vaulting is of oak, and of great height.

Round the outside of the clerestory of the nave there is a continuous gallery, formed within the thickness of the walls, and faced by small octagon columns and arches of the Tournay stone, originally polished.[9] Elsewhere there are various galleries in the walls, so that all parts of the building are practicable.

The same stone is employed in the construction of the building as the rock consists of on which it stands, so that it may be said to be a continuation of the solid substratum. Nevertheless, there are many very serious fissures and settlements, especially in the transept and choir, which need extensive repair. The west front of the building has been disfigured by various alterations; a groined porch in the pointed style extends the whole length of the front, and above it a large pointed window has been introduced, so as to destroy entirely its original character.[10] There is a variety of sculpture under the porch, but the greater part of it is modern and very uninteresting. The cathedral is entered by two doors, one on the north side of the nave, and the other on the south, adjoining the transept. The north door is seen in the external view of the north absis at the head of the next chapter, (Fig. 2,) and is of the transition period. It consists of a semi-circular archway beneath a pointed trefoil arch, the whole profusely adorned with ranges of sculptured figures, animals, and foliage. On each side of the light which occurs between the circular and the pointed arch, is a small twisted column. The four towers of the transept are each different in detail, and have been executed at different times. They all display, however, a mixture of pointed and semi-circular arches.

The whole length of the cathedral within the walls is, as nearly as I can estimate it, 420 feet. The transept, which is nearly in the centre of the building, is 212 feet from north to south. The width of the nave including the ailes, is 70 feet; the choir is a few feet wider. The height of the choir is 110 feet. As a datum for comparison, it may be mentioned, that Salisbury Cathedral, according to Mr. Britton, is 450 feet long within the walls, 78 feet wide in the nave, and that the height of the choir is 81 feet; in other words, it is 30 feet longer, 8 feet wider, and 29 feet lower than that of Tournay.

[7] In a chapel, south side of choir, the spandrils of an arcade are painted to represent angels bearing scrolls.

[8] These flying buttresses are double. The upper arch was apparently formed first, and this being found insufficient the lower arch was then added.

[9] There is a curious gallery of this description round the Eglise de Chateau in Tournay.

[10] The west front had originally two small towers at the angles. These towers at the extremity of the west front are found in many buildings in Belgium, at the Eglise de Chateau before mentioned, St. Bavon, Ghent, &c.

(To be continued.)

CANDIDUS'S NOTE-BOOK.

FASCICULUS XLIV.

"I must have liberty
Withal, as large a charter as the winds,
To blow on whom I please."

I. Were architectural performance to keep pace with architectural promise in this country, we should have some magnificent works; but as ill-luck will have it, either something or other interferes to check the undertaking—to blight it in the bud, or the thing itself turns out wofully inferior to promise—far more liberal than discreet. Of such untoward *turn-outs*, not a few might be enumerated. The poor Edinburgh Parthenon was nipped in the bud: after a few of its columns were put up, it was discovered that "Auld Reekie" was not another Athens, and that an Hellenic Doric face would look as awkwardly upon the Calton Hill, as the helmet of Minerva herself upon an old washerwoman or Meg Dods. It was to have been a temple of Scottish worthies, but some one asked where they were to find worthies to fill it; so though that Parthenon did not fall to the ground—for there was nothing but a few columns to fall, and they are still standing—the scheme did. Not so that of Buckingham Palace; that was erected, and remains a monument of those twins in architectural taste, King George (IV.) and Mister Nash. We were there promised "a magnificent edifice in the most dignified style of Grecian architecture." So magnificent was the original design—so carefully had every part been studied beforehand, that no sooner were the two little boxes intended for wings put up, than it was found out that they were intolerably paltry, and must come down again; and afterwards, another grand discovery was made, namely, that the little dome on the centre of the west-front, was so impertinent as to show itself from the Park, where it was not intended to be seen—and that it would so, might have been ascertained, by a model of the intended structure; but models are expensive things—too expensive to be thought of by such a strict economist, and so careful of John Bull's pocket, as was John Nash! The National Gallery, at any rate its façade, was to have been a prodigiously classical piece of architecture; whereas, its *turn-out* exhibits to us a "beggarly account of empty" niches above, and a cockney display of area railings, and kitchen windows below; to say nothing of a blank pediment—typical, perhaps, of the state of sculpture in this country; of scaffold poles left sticking by way of *garde-fou* between the columns of the portico; of the dome, which looks about as elegant, though somewhat less droll, than the huge cowl at the Old Bailey. The York column was to have rivalled that of Trajan, but as it was found impossible to eke out the Duke's martial achievements so as to cover the shaft with them, that part is left quite bare: nevertheless, it is still, no doubt, the express image of its prototype. The Nelson monument—ah! what was the Nelson monument to have been, or rather, what was it not to have been? There we were told to anticipate a work, of which English art would have reason to be proud. "All the talents" were called out on that occasion, and we have got a tolerably decent model of one of the *five* orders, upon the top of which, Nelson will look like the wick of a candle burnt down to its socket. Again was public expectation raised to the highest pitch: the new Royal Exchange was to be a phœnix—in more senses than one—an edifice worthy of the first country in the world, and of the dignity of the City of London.—Well, if it should not exactly answer to our ideas of what is worthy of the first, it will doubtless amply redeem the promise put forth for it as regards the last, since should it *turn out* to have a more shop-keeping than dignified physiognomy, all the more characteristic may it be of the *dignity* of the City.

II. Hardly will his letter to the *Athenæum* obtain for Professor Cockerell a benediction from Professor Pugin; neither is it likely to be much better relished by Puseyites, Camdenists, and "Ecclesiologists," and whatever other *ists* there may be of the same kind. "Until the subject of our ancient architecture is studied," says the Professor, "the true spirit and intention of that architecture will

never be understood; and it will then, possibly, be found, that the intercessions of saints, and the pride of heraldry, are not in accordance with the free spirit of a Protestant, and a free people of the 19th century; and we may then shake off this *dull, unmanly copyism which disgraces our school*, and daring to think for ourselves, *invent* and *perfect* an architecture suited to the ideas religious and moral of our times, and in accordance with the materials and structure of an improved practice!" There's heresy for you, with a vengeance! What say you to that Joseph Gwilt? Why, the smallest of the "small-fry" could have uttered nothing half so mischievous and vile! *Invent*, indeed!—*perfect* too! By the beard of Vitruvius—if he wore one—it is truly scandalous.—"Dull, unmanly copyism!" What say you to that, Sir Robert?—the audaciousness of it must make your hair stand on end. What say you again, Friend Welby, to that same fling at "copyism," and the expressive hint, that the spirit of our ancient architecture is not exactly in accordance with the spirit of the 19th century? Well, after all, you have reason to comfort yourselves that Cockerell did not have a fling at Lord Shrewsbury and his "Inspired Virgins," who turn out, it seems, to be just what might be expected of miracles and miracle-mongers in this 19th century.

III. Architectural painters and draftsmen are privileged, it may be presumed, to lie with impunity, a licence of which some avail themselves so freely, that some of their productions are no better than so many downright graphic falsehoods, which, by greatly exaggerating or flattering the buildings so shown, cause disappointment when we afterwards behold them. It is a very common mode of lying, with them, to draw their figures, which should always serve as a faithful scale to the architecture, so much smaller than they ought to be as to convey the idea of the buildings being very much larger than they really are. Another common piece of deception is to throw in forced effects of light and shade that are never to be seen in the real objects. By no means is it an uncommon trick to put in, not merely positive, but most violent and exaggerated shadows on the upper part of a building, while all below is quite light;—shadows which we must suppose are occasioned by a score of balloons hovering over us just up in the air.

IV. It was to be hoped that the invention of the Daguerréotype would ere this have been turned to a very great account for the study of architecture, and have been made to supply us with perfect and trustworthy representations of buildings, more especially of such as have not yet been represented at all. With regard to subjects of the latter kind, this does not appear even likely to be the case. Certainly it is not so with the "*Excursions Daguerriennes*;" for there some pains seem to have been taken to select some of the stalest subjects possible, and to avoid any which in addition to their intrinsic attractions, would have those of novelty and freshness. This is rather—or more than rather—provoking, so exceedingly perverse, in fact, that one is quite puzzled to account for it. Those who provide the engravings for the large sheet almanacs, seem to have the same relish for staleness of subject. The Cambridge almanac for this year has an interior view of the hall of Trinity College, instead of the façade of the new Assize Courts, as might have been expected, and which, shown upon that scale, would have formed an interesting architectural plate. Again, there has been so very little building going on of late, and that little so undeserving of their notice, that the "Stationers" have been obliged to go to Greenwich Hospital for the subject of the engraving to their almanac. Well, some fifty years hence, perhaps, the turn will come for Cockerell's Sun Fire Office, and Moxhay's Commercial Hall.

V. A sort of materialism seems to be just now prevailing in architectural doctrine, that is more likely to give us able builders and cunning "artisans" than real artists in their profession. No doubt, in a merely utilitarian point of view, it is far more important that we should have the former than the latter. Art may be dispensed with, or treated as something altogether subordinate; but then, let us, in fairness, abate our claims in behalf of architecture itself, as one of the fine arts, and to which, in its quality of such, we look for æsthetic charm and power. "Mere builders," is quite as strong a term of reproach as "mere artists;" and is one by very far more generally applicable than the other, since there are but comparatively few in the profession—and not everyone among the professors themselves—who show themselves to be artists at all; most of them being no better than respectable copyists and plagiarists, unable to catch the spirit of their models, and both preserving *that*, and combining with it some spirit of their own, to give us some fresh ideas worth having, and produce works that might deserve to become models in their turn. It must be admitted that the studies belonging to an architect are very multifarious; yet, while undue stress is laid upon some, which, after all, are but means—the mere scaffolding of his art—that which is assuredly not the least important among them is overlooked, namely, the study of *design*, by which is to be understood something more than that mechanical species of it, which may be learnt *secundum artem*. "But," say the feeble and the timid, "it is safer to stick to mere rules: to pretend to deviate from them, and aim at originality is very presumptuous, and moreover, exceedingly hazardous and dangerous." No doubt: yet it is by that daring which some call rashness, that glory is won, and through perils and hazards that conquest is achieved—in art as well as in arms. Of course those whose valour and prowess are calculated for nothing more arduous and perilous than a sham fight or review, do well to abstain from entering a field where only master-spirits may hope to win, and where even they may fail and fall.

VI. Greatly do I envy Professor Donaldson the possession of that pair of spectacles, which enables him to discern "lines of palaces at Pimlico and on the north side of the New Road," and magnificence in Regent Street! George Robins could hardly have been more liberal of praise in one of his puffing advertisements; and from him such puff would have been received for just what it is worth; but from a Professor and *ex cathedra!* it is *un peu fort*. Such excessive liberality on the part of the Professor at University College, is the more remarkable, because he could not find even one syllable of praise to bestow on a certain building in Gower Street, which some hold to be a very fair piece of architecture, although they are so fastidious in their taste, as to have no admiration for Pimlico palaces—not even for *the* palace, and for Regent Street magnificence. Perhaps the Professor was afraid of alluding or calling the attention of his auditors in any way, to the portico of the building they were assembled in, knowing that its columns had been compared by one very great authority in such matters, to "Ten Cyprians," a class of ladies that ought not to be allowed at Colleges and Universities. As to the great critical authority alluded to—one, by the bye, who holds architectural criticism generally, in abhorrence, much as he has scandalized at "Wilkins' Corinthian Cyprians," he is quite enamoured with those of St. Martin's Church.

NEW ARCHITECTURAL SOCIETY EXTRAORDINARY.

SOME witty but malicious wag has just been amusing himself by circulating a hoaxing *jeu d'esprit*, which imports to be a list of the officers of a new Architectural Society, and in so doing has made exceedingly free with many respectable names, attaching to several of them some of the most ludicrous titles imaginable. We suspect that it comes from some one who is no very great admirer of Mr. Gwilt and his opinions, for that gentleman's name stands very conspicuously at the head of the list, where he is sneeringly designated "Professor of *Latin* architecture,"—a style of architecture never heard of before—and as "Vitruvian Professor," which last title seems to be intended to be a double shot, and to allude contrastingly to Mr. Hosking as the "Anti-Vitruvian Professor," and therefore in Mr. Gwilt's opinion, a Professor of Architectural Heresy and Radicalism. Then we have Mr. Valentine Bartholomew, "Professor of Fruit and Flower-painting,"—an odd sort of appointment in a college of architects; Mr. G. Aitchinson, "Professor of Concreting and Opus Incertum,"—in which last there are, if no professors, plenty of practitioners already. How Mr. Billings will relish the title of "*Itinerant Delineator*," we know not;

but it is a tolerably safe one, since no one will care to rob him of it, the epithet being just next door to that of strolling player. Mr. W. Bartholomew is named as "Honorary Solicitor," and if by that is meant he is to do all the law business of the society "gratis for nothing," he must be a real phœnix in *his* profession—something more wonderful than all other Professors put together. We never heard, before, of "*Baptisterographer*," yet such is the high-sounding title conferred upon a Mr. W. P. Griffith. Besides these, there are a "Custos,"[1] a "Recorder," and a "Cataloguist"! Of Professors of one kind or other there are no fewer than eight; so that the title is likely to become quite a drug—so dog cheap that no one will think it worth having. But the drollest thing of all still remains to be mentioned: would it be believed that these professed and professing "Free-masons" have got a female among them, contrary to the well-known regulations of that mysterious craft? And what office does the lady fill? Is she their "Professor or Professoress of cookery." Oh, no! There would be nothing very ridiculous in that; especially as there is a "Gibbons' *Carver*," and there must, accordingly, be a cook to provide materials for him to operate upon. No, the lady's office is to be that of—guess if you can, but we defy you to do it; therefore not to teaze you any longer, tell you it is to be that of "Embroidress!" Think of Professors, and a Vitruvian Professor among the rest, being jumbled up with an "Embroidress"—alias a Professor of Millinery! O, Vitruvius, how art thou fallen! Dignity of Art, how art thou sunk!—so low that ne'er shall we be able to dig thee out again!

Not contenting himself with this bit of quiz, the author of it has very unceremoniously mentioned several gentlemen as individuals on whom it is proposed to confer Honorary Fellowships, and has even had the audacity to make free with the name of Charles Barry; which is certainly carrying the joke a little too far. He has also put down those of both Willis and Whewell, and we need not say very blunderingly, since the "Vitruvian Professor" holds their writings in such contempt, that he has thought proper to omit them in the list of architectural works inserted in his Encyclopædia. It being merry Christmas time, some license may perhaps be allowed to the jokers and lovers of fun; but we suspect that many of the parties who figure in this *jeu d'esprit*, will consider it very sorry fun—not at all better than a *fort mauvaise plaisanterie*.

RESTORATION OF THE CHURCH OF SAINT MARY, REDCLIFFE, BRISTOL.

[It affords us much pleasure to be able to lay before our readers the following address of the Vicar and Churchwardens of the church of St. Mary, Redcliffe, Bristol, on the proposed works necessary to be done to restore this noble specimen of ecclesiastical building to its pristine grandeur; and we are happy to see that the combined talent of Messrs. Britton and Hosking have been engaged to report upon the necessary works requisite to be done: the one is well known for his antiquarian disquisitions and his love for all that concerns the Christian architecture of Great Britain, and the other for his thorough knowledge of construction and architecture, which insure that the public will have that justice done to the building that it so well merits. We heartily join in the appeal, and do hope that every architect will exert his influence, in stimulating the public to come forward with subscriptions, for the restorations requisite this noble edifice.]

The Vicar, Churchwardens, and Vestry of the Parish of St. Mary, Redcliffe, having resolved upon a public and extended appeal on behalf of the venerable and once splendid fabric entrusted to their care, prepared and circulated, in July last, an address briefly stating the circumstances which appeared to them to justify such appeal. That address explained the preliminary steps which the parish authorities had adopted, and especially their selection of Mr. Britton to advise respecting the decayed state of their church, and the best mode of restoring it to its pristine integrity and beauty, with their reasons for such selection. The result of their communication with that gentleman was his calling to his aid Mr. Hosking, Professor of architecture and of the arts of construction, at King's College, London, whom the Vestry, at Mr. Britton's request, have associated with him in the commission.

These gentlemen having carefully and fully surveyed the church, presented to the parish authorities luminous and detailed reports, on all the matters referred to them, accompanied by plans and drawings illustrative of their views. In the conclusion of their preliminary address the parish authorities stated that the reports were thought too copious for printing on that occasion; but that in a subsequent appeal, an analysis should be given, to embrace their more leading and prominent parts, and illustrated by copies of some of the drawings. It is in fulfilment of this intention, and of the pledge contained in their former paper, that the Vicar, Churchwardens and Vestry, now present this more extended address, in the hope and belief that the public will feel as well satisfied as the parish authorities in their preliminary address stated themselves to be, that the able and eminent architects alluded to, have, in their consideration of the matters referred to them, "been governed by views not less honourable to their reputation for taste and science, than for sound and practical knowledge, and that could the views of those gentlemen be carried out, our city would possess a parochial church, and the west of England a national monument, of unequalled beauty, and one to be visited and admired by multitudes of strangers of our own and of foreign nations."

In their reports on the present state and contemplated repairs and restoration of the church of St. Mary, Redcliffe, Messrs. Britton and Hosking commence by drawing the attention of the parish authorities to the injuries sustained by the fabric, from the long-continued access of damp and moisture, both in the superstructure and foundation walls—produced, as to the *former*, by the insufficient means for carrying off the rain and snow—and, as to the *latter*, by the want of drainage; both which deficiences they principally ascribe to the original arrangement for the discharge of water from the roofs, and want of drainage round the fabric. To the former of these defects, they attribute, in a great degree, the injury to, if not destruction of, the external faces of the Masons' work upon the walls and buttresses. They have, in much detail, set out the nature, extent, and causes of the mischief; and, in a subsequent part of their report, have suggested, with like detail, the extensive and efficient measures recommended for remedying the evils alluded to, and for preventing their future recurrence.

They describe the *roof covering* as, throughout, in a very defective state, though heavy expence is annually incurred in repairing it; and they suggest its entire re-arrangement and re-construction, upon the principles described in their reports.

They have also ascertained and have very accurately described, an original defect existing in the great tower, evinced in a bulging outwards of the external faces of that part of the structure, and produced by an inequality of strength and resisting power between the finely-wrought and closely-jointed masonry of the faces, and the rubble backing which constitutes the main bulk of the walls; and they state that, with the exception of the tower and the flank wall and buttresses of the south aile of the chancel, all the walls and foundations, throughout, appear to be perfectly sound and but little injured They attribute the settlement outwards of the flank wall first noticed to the want of proper drainage before alluded to, and to the too near approach of graves to the foundations of the wall in question, which are not, in that part of the fabric, more than four or five feet in depth;

[1] Quære, should not this be "Custard-maker?"
Printer's Devil.

and they state that, by an attempt formerly made, to prevent the flank from going further, or to hold it up, mischief has been occasioned to the pillars which stand between it and the chancel, and, through those pillars, to the clerestory resting upon them. They express their opinion that the chancel is in an insecure state therefrom, and point out in very strong and clear terms the mischief and danger to be apprehended, unless immediate attention be given thereto; and they enter, at considerable detail, into the comparative inefficiency of the repairs which have been from time to time effected.

Recurring to the tower, they state, that the solid structure of this beautiful work is generally sound and trustworthy, though its *exterior surface has almost wholly perished;* and that from the dilapidated state of the whole exterior and especially of the enrichments previously noticed by them, the tower is unsafe to approach; and they therefore recommend means for excluding persons from passing within reach of the danger to be apprehended from the constant liability of fragments of stone, of no mean size, to become detached, and to fall in every direction.

They represent the masons' work of the spire as generally sound, though the surface of the stone upon the exterior is rapidly disintegrating from the causes described in the report.

In proceeding to advise as to the solid and substantial repair of the fabric, in its more important parts and the restoration of the ornamental parts, Messrs. Britton and Hosking state that so intimate a connexion exists between the parts of such a building as that under consideration as to render what may appear to be merely ornamental in most cases essential to the stability of the structure—that they feel themselves compelled to report on these two heads together; and they furnish very able and sufficient grounds for their determination—but dividing the subject into two parts, viz.:—

First, the tower and spire—and second, the church with the lady chapel, the porches and other accessories.

With respect to the first, it would be injustice to the architects to give in any other language than their own, the suggestions they have offered, viz. :

"*The Tower and Spire.*—This singularly beautiful composition is altogether distinct in style and date from the Church, which has been added to it, and deserves, as it requires, to be considered, not as a merely provincial edifice, and far less as a simple parish steeple, but as a national monument, and in the first rank of the many noble structures of the kind in existence in this country. In magnitude it is exceeded by few; in destined altitude, the larger Cathedrals alone would excel it; and in chaste simplicity of design, combined with elaborately beautiful, but subdued and appropriate, decoration, Redcliffe tower is surpassed by none; whilst it is pre-eminent in its position, on a lofty bank of the Avon, within the commercial capital of the west of England. We have already intimated, that the solid structure of the tower is sound and trustworthy, and that it is capable of being easily made to bear all that it was ever intended to carry. The structural arrangement of the tower itself, and of the existing portion of the spire, give the completest evidence that the original design contemplated as it provided for a spire of the form and proportion exbibited in the accompanying engraving of the church. It would appear, however, that when the church was built the idea of completing the spire was abandoned, as the south-western buttresses of the tower were reduced in projection, and otherwise altered to compose with the west front of the church—and the south-eastern angle was altered, throughout, to extend the nave of the church uninterruptedly to its western front. The tact and skill with which the outer, or south-western angle of the tower was altered, and the fine taste with which the turret pier, in front of the church, which composes with the reduced buttress of the tower, is arranged, to connect the parts of the composition, are most admirable; but not so the arrangement at the other angle—where a low, heavy arch, and an unmeaning blank, upon a heavier pier, obtrude themselves immediately within the church door—contrasting, most disadvantageously too, with the composition of the arches of the aile, and with the clerestory on the other side of the entrance.

"It may be remarked here, that, at the time Redcliffe church was built, the taste which produced the original design of the magnificent superstructure to the tower no longer existed; spires were not built to Gloucester cathedral nor to Bath Abbey church, in the 15th century—as they had been at Salisbury, Norwich, and Litchfield, in the 13th and 14th centuries; comparatively small spires, on lofty towers, as at Louth and Newcastle—or lanterns, as at Boston, indicate the prevailing taste, in that respect, when this church was built, and the abutments of the spire of the original design were altered or removed. In this manner the incomplete or demolished spire was left, and the original composition was shorn of its fair proportions.

"In compliance with the instructions to us, to advise as to such alterations in the restoration of the ornamental parts of the fabric both external and internal as may seem necessary for reinstating it to its ancient and pristine beauty, we urge, most strongly, the necessity of restoring, at the same time, the perished surfaces of the tower, and its immediate accessories, adapting it to receive the completed spire, and carrying on, to completion, that beautiful feature of a masterwork of architectural composition, which, in its truncated state, is but an unpicturesque deformity. Thus the original design may be both restored and completed, and Bristol possess a noble national monument, that will add to the beauty of her locality and to her pre-eminence amongst English cities.

"In restoring the tower, as contradistinguished from the superimposed spire, it will, of course, be proper that the work should be set upright on all its faces; and, in doing this, it will become necessary to take out and reinstate the whole of the ashlaring of the surfaces, even when it might otherwise remain, though that, indeed, is of very small extent. Moreover, all the stones upon which the enrichments occur must, of necessity, be drawn, wherever the enriched surfaces are defective, and these requirements together would involve the reinstatement of all the external surfaces of the tower. Paring old work, and pinning in patches of new stone, where there is not any left to pare, we consider altogether out of the question—as paring would reduce the original proportions of the design—and pinning in, among the pared faces, pieces in the place of stones altogether ruined, would not produce a restoration of the fabric to its ancient and pristine beauty. The absolutely necessary restoration of the faces of the tower, with its buttresses, turrets, pinnacles, niches, canopies, pediments, windows, and their enrichments, parapets, cornices, and corbels, will give the means of doing all that is necessary, with a trifling exception, to fit the tower to receive the spire of its full dimensions. This exception involves an alteration within the church; but we shall be able to show that what is required there can be made, not only consistent with, but most desirable for, the services of the interior.

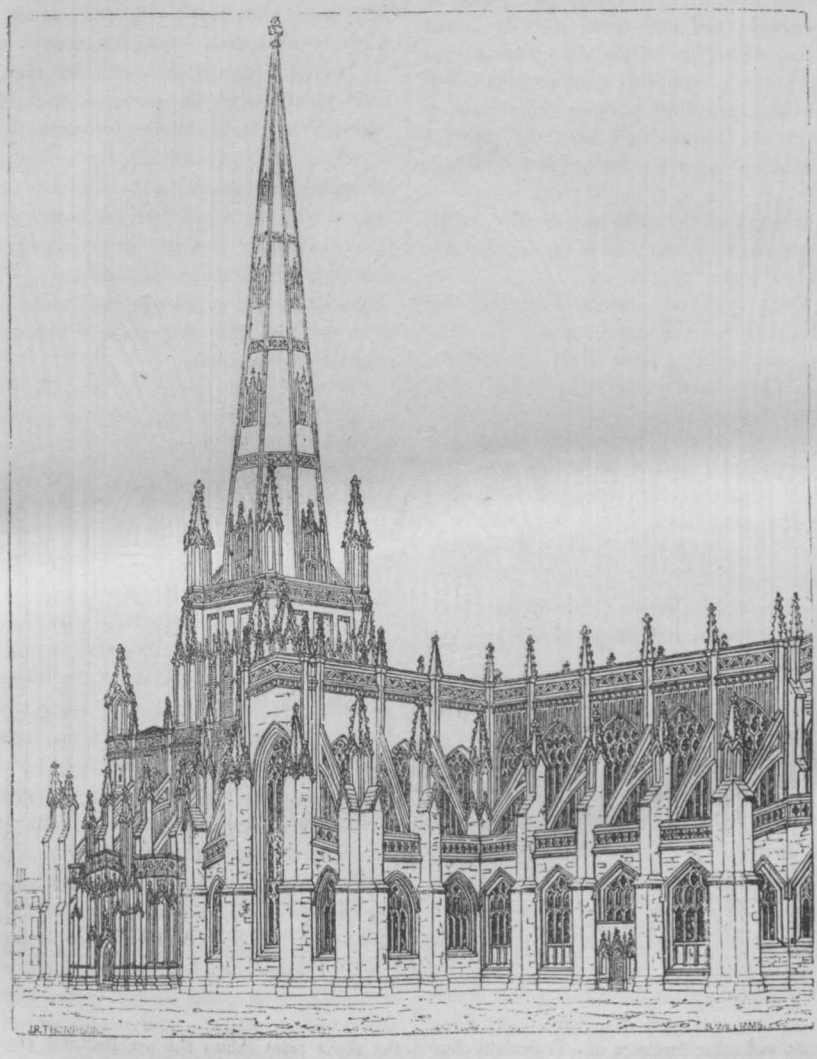
"The existing portion of the spire is, fortunately, quite enough to give the means of developing the original design, whilst it affords demonstrative evidence that a complete spire was contemplated by the original designer of the structure. If lines be drawn from points within the footings of the buttresses of the tower, through the base of the spire, on the summit of the tower, they will follow the sides of the spire, as far as it now exists, and meet at such a height as similar compositions of equal date would justify by analogy. We have drawn such lines, or rather we have set up the present compartment, as it exists, and find that its thrust is within the abutments afforded by the buttresses, and that the sub-structure generally has the strength necessary to carry the superstructure resulting from carrying it up to the height indicated; which height results from a continuation of the same lines upwards, and is further justified by the best existing examples of works of the same class.

"The decorations of the spire, as it exists, are of singular beauty and propriety; the ribs are exquisitely moulded, and the characteristic enrichment of the vertical and pointed mouldings of the tower below, is carried with great good taste and beautiful effect up into the spire, so that nothing has to be imagined in that respect; and we may say with confidence, that the de-

CHURCH OF ST. MARY, REDCLIFFE, BRISTOL.

VIEW FROM THE SOUTH-EAST, WITH THE SPIRE,

AS PROPOSED TO BE RESTORED.



The general style of architecture and the ornamental details of the church above indicated are replete with beauty, and present to the eye of the tasteful and intelligent observer a series of exquisite subjects for study and contemplation as viewed from different points. The view from the south-east, as shown in the annexed woodcut, represents the tall and narrow south transept, with its aisles, windows, highly enriched flying and attached buttresses, perforated parapets, and purfled pinnacles; the south porch, of two stories, and newly designed staircase turret, the flying buttresses and clerestory windows of the nave, with the bold crocketed pinnacle, which surmounts the stairs at the south-west angle; rising above the west end of the northern aisle are seen the upper or belfry story of the noble tower, with its richly adorned panels, boss-enriched mouldings, and perforated parapet; the bold and finely proportioned octagonal pinnacles at the angles of the tower; and rising from among them the lofty graceful spire, crowning and adorning the whole. Of this last splendid and heaven-pointing architectural member of a Christian edifice, there are numerous examples both in England and on the Continent, which are now admired as they deserve to be admired; but, however meritorious and beautiful may be the spires of Strasburg, Salisbury, Freyburg, Lichfield, Norwich, Louth, or others of less note, Redcliffe spire, in form and detail, as indicated by its existing portion,[1] and as it is susceptible of being rendered, with the tower, its legitimate base, may challenge a comparison with them all.

[1] The "existing portion" of the spire is not more than one-fifth of the whole height, or up to the first enriched band.

CHURCH OF ST. MARY, REDCLIFFE, BRISTOL.

VIEW OF THE NAVE, ETC., LOOKING TOWARDS THE EAST, RESTORED.

Divested of pews, seats, and other furniture of a Protestant church, the above print shows the architectural character and details of the Interior of this truly beautiful edifice. If not equal in sculptured decoration to the gorgeous chapels of Henry VII, London, and King's College, Cambridge, it will bear comparison with those justly famed buildings, and will be found to surpass most of the cathedrals and other large churches of our own and of foreign countries in this respect. Although in miniature, this beautiful delineation in wood engraving displays the finely moulded and shafted piers or pillars, with the arches to the aisles, and the panelled walls above them in the situation of the triforium of the large cathedrals. Over this traceried wall is a series of clerestory windows of large dimensions, and of fine forms and proportions, with mullions and tracery. These, it is reasonably inferred, were originally filled with stained glass "casting a dim, religious light" over the whole scene. Connecting, and apparently tying together, the two side walls, is a groin-vaulted ceiling, profusely adorned with intertwining moulded ribs, foliated tracery, and richly sculptured bosses spreading over the whole. In the view presented by the engraving, the eye ranges through a beautiful vista full of the most charming architectural effects. It requires but little stretch of fancy to imagine the exquisite, and indeed sublime, appearance of the whole, were the windows filled with pictured glass, and the ribs, bosses, and capitals of the vaulted ceilings, and of the shafted pillars, with gold and colours "richly dight."

sign, as we present it, of the tower, with the restored spire, is a true presentment of the original intention of the first designer. We may have omitted to state hitherto, however, what is most satisfactory to know, that in the midst of the dilapidation and disintegration which pervade the work, *nothing in the moulded forms or other enrichments, and nothing in the forms and proportions generally, is entirely lost; but specimens remain, from which restorations may be made with certain truth.*

"It will be remarked, that the basement of the tower, in the drawing of the elevation of the west front, shows a greater depth of faced work than appears at present. This we consider it desirable to restore, to prevent the structure from losing any part of its apparent elevation, in raising the level of Redcliffe Street before the north-west entrance to the enclosure; and we have suggested, in the drawings, a re-arrangement of the steps of approach to the church, in accordance with this view. We propose to alter the windows of the tower, from their present forms and proportions, to others, more in character with the design of the superstructure."

For the reasons detailed in the report, Messrs. Britton and Hosking recommend that attention should be *first* directed to the restoration of the *tower and spire;* and that the former should, under the circumstances, not be deferred any longer, if it be desired to preserve this beautiful monument from utter destruction.

Speaking of "the church, with the lady chapel, the porches, and other accessories," after the recommendations before alluded to, as to what are termed the hydraulic arrangements and the proposed reconstruction of the roofs—Messrs. Britton and Hosking suggest a new gateway at the north-west corner of the church enclosure, and other arrangements consequent upon the recent alterations under the Bristol Improvement Act, and for giving more effect thereby to the beautiful edifice under consideration; and, after their valuable suggestions for the substantial repair of the fabric, in the south flank of the chancel and the transept, they refer to their drawings, as showing with sufficient clearness the restorations they propose of the various parts of the exterior of the building; which restorations, they state, are mostly from existing authority within the building itself—and where no specimen exists of the original parts, the restorations are stated to be made, to the best of their judgment, from analogy. Repeating their difficulty of separating the substantial from the ornamental parts they go on to show that many portions commonly considered merely ornamental are either absolutely necessary, or highly useful, to the substantial structure; and after naming several instances of this sort, they add:—

"We do not contemplate, however, and cannot imagine that the necessary and useful reparations are required to be made in merely shaped blocks of stone without the mouldings and other decorations appropriate to them; and, for ourselves, had rather see the church a picturesque ruin, than be instrumental in restoring it to strength without its native beauty. We propose, therefore, *the restoration of all the decorations that ever existed upon the surfaces of the work*, and that with new materials, and not by paring and patching the old."

They add, however, that, in some few cases, the heads of the windows, with the tracery in them, may, perhaps, be preserved.

The architects propose to move the modern attachment to the south porch, also the lobby to the lady chapel, and likewise the sheds and other unsightly objects about the church, and of the doorway and steps at the south-east side of the north porch; they further suggest certain provisions and restorations consequent on such removals.

As to the interior of the Church.—The suggestions of Messrs. Britton and Hosking refer to matters of which they describe the restoration for the most part as easy. But the most important restoration of the interior is that at the east end, involving the removal of Hogarth's pictures, and other inappropriate attachments, and the reinstatement of the east and clerestory windows; and they hope to find that reparations only will be wanted to the *screen, between the chancel and the lady chapel.* The latter will want certain alterations, including a new floor.

In the restoration of the spire will be involved some alterations, pointed out by them, at the west end of the church, including a new arrangement for the organ; and they express their hope, that as the whole of the lead and glass must be removed from the windows for the restoration of the mullions and tracery, it may, in the principal ones at least, be reinstated with *stained glass* of an appropriate character.

They also propose in detail numerous and important alterations in the re-arrangement of the *pews and seats*, by which, with an increased seat accommodation, and better command from the pulpit, reading-desk and altar, a more perfect view of the building may be obtained, whilst all the beautiful pillars shall be in every case insulated, that the eye may range over their lofty and symmetrical forms and proportions, from the base to the summit.

The reports of Messrs. Britton and Hosking, with their accompanying drawings, though (for want of more time and labour than they have yet been able to bestow) not made with the fulness of detail required for actual operations, are, nevertheless, the result of admeasurements and of careful delineation of the most important parts; and their observations arise from close examination of the work in general and in detail, upon personal survey and attentive study and consideration of what they have observed; and their *estimates* subjoined are the result of such survey and consideration, and also upon comparison with the cost of other large works of analogous extent and character.

The Tower and Spire.—The complete reinstatement and restoration of the tower with its pinnacles, and all its decorations, in the manner, and with the stone they contemplate adopting, will cost about £8,200.

The re-construction and completion of the spire, according to the data afforded by the existing portion thereof, and according to the drawing of the west front restored, and making the requisite additions to the buttresses of the tower, and including the scaffolding and machinery necessary, will cost about £3,600.

The Church, with the lady chapel, the porches, and other accessories:—

1st.—*The hydraulic arrangements*, including new roofs to the church and lady chapel, the re-arrangement of the north-west approaches, with the earthwork, drains, &c., as recommended in their general report, after giving credit for old materials, will cost £1,850.

2nd.—The substantial repair and reinstatement of the *interiors*, and the repair, reinstatement, and perfect restoration of the whole of the *exteriors* of the church, lady chapel, and porches, including the reworking of the whole of the external decorations in the stone alluded to, together with the alterations and presumed improvements recommended in the general report, it is estimated will cost nearly £21,400.

3rd.—The re-arrangement and refitting of the interior of the church as proposed by Messrs. Britton and Hosking, will cost £2,600. *The whole* presenting a total outlay of £37,650, which, with a due estimate for *contingencies*, in works so extensive, and of such comparatively novel character, cannot, in the judgment of the parish authorities, be safely calculated at a sum much less than £40,000.

It is, however, stated by the architects, that the expense under the 2nd head may admit of reduction, by their finding, on further examination, portions of the work capable of remaining, or of being reworked and re-applied in places less exposed to the weather, and it is their opinion, that the part of the work contemplated in this section may, after precautions are taken to secure it, generally be distributed over any reasonable number of years.

In allusion to the large sum required for effecting the object in all its proposed details, the parish authorities can but repeat, in the language of their preliminary address, that such an amount is only to be raised by the liberal co-operation of those whom providence has

blessed with the ability and the desire to aid in such objects as that for which this appeal is intended; and upon those of our own locality who have been so favoured by providence, they repeat their confidence, that an appeal will not be made in vain for the restoration of a fabric, which, if not wholly the work of a Bristol Merchant, is to be ascribed principally to one of that class. Their confidence is strengthened by the able and energetic support they have received from many and influential quarters, and especially from our local press, by one of whose editors it has been well and eloquently said, that "the question for the public—for the church-going public in particular—to answer, is,—Shall decay be suffered to proceed until restoration shall have become impossible? The amount required (£40,000) for the complete repair of the fabric is certainly great, but when we recollect the large sums which have been raised for the restoration of Hereford Cathedral, and of York Minster, we cannot doubt that the nobility, gentry, and wealthy commoners of Gloucestershire, Somersetshire, and the neighbouring counties will evince equal liberality in worthily upholding—

"The pride of Bristowe and the western land."

The parish authorities, whilst they feel that they cannot, with propriety, divest themselves of the responsibility of carrying out, so far as they shall be enabled to do, the repair and restoration contemplated, feel sensibly that the public, from whom the means of accomplishment is so largely to be drawn, are entitled to every reasonable security for the due appropriation of the sums contributed, and it is therefore the desire of the parish authorities, at an early period after any considerable subscription shall be obtained, to convene a *meeting of the subscribers*, by the majority of whom, subscribing not less than £10 each, six contributors of not less than £50 each shall be chosen, who, with the members of the vestry for the time being, shall form a committee for carrying out such repair and restoration, and for controlling the monies received, and the expenditure thereof.

The parish authorities in aid of the object intended, propose to anticipate, as far as they possibly can be advised to do, the revenues of the estates vested in them for the repair and support of the church, and by means of which, that object has been hitherto (however inadequately) accomplished without the parish having been ever burdened by a *church rate*, and from this source they will apply the sum of £2000, to be paid, as they propose the individual contributions shall be paid, by five equal and successive yearly instalments, to meet the expenditure as it will probably annually progress.

In conclusion, the vicar, churchwardens and vestry, of St. Mary, Redcliffe, venture to quote and apply to their church, the language used by the learned and Very Reverend the Dean of Hereford, in reference to his own cathedral, which at the present moment is in a dangerous state; but which is likely to be preserved and renovated by the united efforts of the benevolent friends of the church and of Archæology.—"Restoration, is the grand object to be achieved, not mending and patching." * * * * * "I earnestly intreat that restoration may be regarded as the one thing sought—sound and legitimate restoration, for which there is sufficient authority."

To the preceding appeal the parish authorities append the following remarks and suggestions by their senior architect, who, as an antiquary and author, has laboured nearly half a century to elucidate and illustrate the ecclesiastical architecture of Great Britain.

M. R. WHISH, *Vicar.*
THOS. PROCTOR, JOHN FARLER, } *Churchwardens.*

EXTRACTS FROM THE REMARKS AND SUGGESTIONS BY MR. BRITTON.

To those persons who are not acquainted with Redcliffe Church, it may be both interesting and useful to give a short account of its peculiarities, beauties, and historic annals.—As a parochial Christian temple it is acknowledged to rank, if not the first, at least in the first class, amongst the many fine sacred edifices of our country. As compared with the cathedral and conventual churches of England, it surpasses most in symmetry of design—in harmony and unity of character—in rich and elaborate adornments—in the picturesque composition of exterior forms and parts—and in the fascinating combination of clustered pillars, mullioned windows, panelled walls, and groin-ribbed ceilings of the interior. I know of no building, to compare with it in all these features, in Great Britain, and I feel assured that there is none superior in graceful design, and beauty of detail, in all civilized Europe. Except the cathedral of Salisbury, which is nearly of one age and design throughout, the other cathedrals, and indeed most of the large parish and conventual churches, consist of heterogenous parts, of varied and discordant dates and styles.

The accompanying views of Redcliffe Church, though on a small scale, cannot fail to impress every eye that can see, and every mind that can appreciate the beauties and merits of architectural design, that the church, now fast approaching ruin, was once, as it may again be made, a splendid edifice; a temple eminently adapted for the soothing and sublime devotions of Christian worship, and also calculated to impress every spectator with wonder, delight, and admiration.

The architect and the antiquary who read plans and sections of buildings, as the musician reads notes, will instantly perceive, that the church referred to is systematically and beautifully arranged; that its interior abounds with clustered pillars, and richly-ornamented ceilings; that its walls are pierced with large windows, divided by mullions, and strengthened with buttresses to resist the thrust of the arched ceilings; that it has a transept of unusual design, being divided into three nearly equal parts; that there is a presbytery, or chancel, with ailes, divided from it by richly-devised screens; that there is a lady-chapel, east of the chancel, separated by another open screen; that there are two small apartments, for a resident chantry-priest, north of the chancel-aile, in one of which is a fire-place, showing it to have been a dwelling, the whole being of unusual occurrence; that there is a double porch on the north flank of the church, manifesting in form, style of walls, ribs, and stairs, different ages of erection; also a porch on the south side, differing, again, from the double north porch in every respect; that the wider and stronger walls at the north-west angle of the plan, show the foundation of a tower; that there is a doorway for entrance at the west-end, central to the nave; and that different flights of steps, from north to south, traverse the west-end, and show that the ground ascends, quickly, in that direction. Aided by the accompanying engravings, of a view of the church from the north-east, and interior; any person may readily understand the architectural characteristics of the church referred to; and those who have studied Christian architecture will immediately perceive its peculiarities of form and arrangement, as well as the chaste profusion of its ornamental details.

Although essential and substantial repairs and restoration be the main objects in the contemplated works, these will be applied to the interior even more than to the exterior of the building; for if the latter may be regarded as the shell, the former is the kernel—if the last be the case, the first is the jewel intended to be preserved. Indeed, as the inside of Redcliffe Church was in its original and finished state an architectural design of pre-eminent richness and beauty—as it was destined by its founder and architect to surpass all its neighbours in originality of composition and elaborate finish, so was it adapted to satisfy the wants and wishes of those for whose devotions it was intended—the present architects, emulous to follow such example, propose to render it fully and completely adapted for the rites, as well as the habits, of its protestant occupants. In doing this, they consider it material to provide accommodation for the many, rather than merely to please the few; they think the clergyman and his congregation should be in such close communion, that the former may be seen, as well as heard by the latter. If the numerous shafted

pillars tend to interfere with this communion in some degree, the few sittings, so placed as to be out of view of the minister, will only be resorted to on emergencies. In designing and disposing the altar, the desk, and the pulpit, the organ, and the font, as well as the required number of seats, the most scrupulous attention will be paid by the architects to the ancient usages of the Anglican church, and they confidently anticipate many striking and beautiful scenes and effects when the whole is completed, the subordinate appendages being made to correspond and harmonize with the architectural disposition and character of the church. A learned and travelled clergyman who has devoted some years to the study of the church architecture of the middle ages, writes to me thus—"The harmonious effect of Redcliffe Church must at one time have been quite unrivalled. I am not aware of any cathedral or parish church, either in England or abroad, that contains an equal amount of rich and uniform vaulting. The bosses, more particularly, both in quality and quantity, surpass all that I have met with elsewhere."

To accommodate and afford every degree of comfort to even larger congregations than have generally assembled within the walls of this church, we have made such arrangement of the seats, as shall bring all persons more fully and freely within sight and hearing of the minister; and have also taken especial care to display the complete height and design of all the graceful clustered pillars of the edifice.

There are four palpable varieties of Christian architecture in Redcliffe church, manifesting as many architects, and as many different times when they were respectively designed and erected. The inner north porch, or vestibule—the tower and spire—the outer north porch—the body of the church, with the lady chapel, and the south porch—we feel assured were built successively, and it is generally admitted, that an older church was removed to give place to the present nave and chancel with their ailes and the transept. The oldest of these members, *i. e.* the vestibule, is of a date between A.D. 1200 and 1230. "In 1207 Lord Robert de Berkeley granted to Redcliffe church, at the request of William, the chaplain, his fountain of water from Huge well, for the friars of St. John the Baptist in Redcliffe." Lands were conferred on the same church, about that time, plainly showing that there was one then in the parish. The tower and spire we may safely refer to the reign of Edward I, as corresponding with known specimens of that age. According to the chronicles of Bristol, Simon de Burton, who was mayor in 1293, "began to build the church of St. Mary de Redcliffe, when John Lamyngton was chaplain," — (Evans's "Chronological Outline.") Seyer, in his "Memoirs of Bristol" (Vol. II., p. 77) from MS. Calendar, more cautious and particular, says, "It was about the year 1293 or 1294 that Simon de Bourton, a person of wealth and consequence, who was Mayor of Bristol in that year, and bore the same office six times, built the church of St. Mary, Radcliffe, where the eastern end now is." Here we find it positively stated by one writer, that the church was built, and by another that it was begun, at the above date. To us it is quite clear that no part of the present church is so early as 1294.

YORKSHIRE ARCHITECTURAL SOCIETY.

Sir—My attention has been drawn to a letter in the last number of your *Journal*, containing remarks on the Yorkshire Architectural Society. What is *personal* in the letter may be safely left unanswered, as the tone in which it is written will be its best counter-agent.

With respect to the Society, your anonymous correspondent has made several statements, of the falseness of which I hope he was ignorant; these appear to require some notice.

In his letter, it is said "The prospectus contains the names of two architects only, and neither of them attended the Autumn meeting."

Before the Autumn meeting, the prospectus contained the names of *twelve* architects; I saw four present at the meeting, and I believe more attended.

Your correspondent says, "*Two meetings* are to be held in the year, and from the information given at the last, it appears, that for general accommodation, they are to be in the remote corners of the country."

Two *general public* meetings will be held during the year, the places of meeting being *various*, and appointed by the Committee, so as to suit the convenience of the members generally.

Again, "All admitted must be members of the Established High Anglo-Catholic Church." It is true that this Society for promoting the study of *Ecclesiastical* architecture, admits only churchmen; but without respect to their peculiar sentiments. No exclusion of any member of the church has yet taken place, and the Society, amongst its 400 members, includes many churchmen of different opinions.

The last misstatement is, that "the standard for all buildings is to be Parker's Glossary."

At the request of a dignitary of the church, a list of elementary works on Gothic architecture was added at the end of the report, as a guide to any member beginning the study of architecture; in this list Mr. Parker's Glossary was mentioned, together with the works of Rickman, Bloxam, &c. This so far as I know, is the only foundation for the imaginative writer's assertion, "that the standard for all buildings is to be Parker's Glossary." Whether the insertion of such venturous statements on the authority of an anonymous writer suits the character of a respectable periodical, I leave to your judgment.

I am obliged by your having pointed out in your Editorial remarks an unintentional omission in the advertisement there alluded to. It was considered, or rather assumed without consideration, so much a matter of course, that the architect whose plan should be chosen, would have the carrying out of his design, that no express mention of this was thought necessary.

I am, Sir,
Your obedient Servant,
S. Wilkinson,
Hon. Sec. to the Yorkshire Architectural Society.

Leeds, Dec. 5th, 1842.

THE KENTISH TOWN COMPETITION.

Sir—Should what I am about to say appear too pointed against a particular party, that individual has mainly to thank himself for the pointedness of some of my remarks. When we find a man pursuing that very course which he has both loudly and publicly reprobated in others, and protested against—we must suppose, upon principle—when we see a would-be Cato all at once changed into a Clodius, such an offender has little reason to look for that lenity which might perhaps be extended to those, who, whatever their conduct may be, at least make no parade of being greatly more upright and conscientious than their neighbours.

That after expressing himself decidedly hostile to competition, after actually saying, "I have endeavoured to go into the *strongest possible condemnation* of which I am capable, of the depreciating effect of competition in architectural design;" that after thus pledging himself in print, and the strongest possible manner, to be opposed to the system of competition in any shape, Mr. Bartholemew should have become, or have even thought of becoming a competitor for the intended church at Kentish Town, is indeed most strange. He cannot disavow those words, and a great many others to the same effect, unless he should now choose to say, that although his name appears upon the titlepage, he is not the *bona-fide* author of the work; and did not even know until after its publication, what opinions it really contained; yet hardly will he resort to such evasion. He must therefore put up with the mortification of having been so imprudent as to publish a good many very harsh reflections that now recoil upon himself. Hardly is it possible to conceive how a man who has denounced the whole system of competition in the most unmeasured—even virulent terms, as one compounded of folly and knavery, and which he accordingly laboured earnestly to put down, should now abet it; should not only join in a public competition, but in doing so, should unfairly evade the restrictions laid upon others, having good reason to know that his doing so would be winked at.

In the list of printed conditions, one was to the effect that none of the drawings sent in should be *coloured*, but merely tinted in sepia. This was sufficiently explicit; there was no possibility of mistaking it. Nevertheless, Mr. Bartholomew's principal elevation was a coloured drawing; and so far he violated the instructions which his rivals had been obliged to conform to: consequently he ought in justice to have been put *hors de combat* at

once. The best that can be said in excuse for him in that matter, is h so far he practised no deception, for the most ignorant set of men must have been able to see whether a drawing was coloured or not, and if they choose to violate the pledge implied in their own instructions to the competitors, the dishonesty rests with them. At any rate *they* have no cause to upbraid Mr. Bartholomew with having acted unfairly. But there was one little *licence* of another kind taken by Mr. Bartholomew, by which they were probably imposed upon. I here allude to the singular discrepancy between the geometrical elevations and the perspective view, in which last, several alterations were made, in order to *improve* the effect. Improvement there was, but it was also direct *falsification*. It was tantamount to saying, "execute the building from this set of designs, and such will be its appearance." And if that does not amount to one of the *tricks* practised in competition, I know not what does. By no means do I pretend to say that Mr. Bartholomew is indebted for the decision in his favour, mainly to that artifice. He would probably have been equally successful, had he taken the liberty of evading the condition which required perspective drawings. I merely mean to say that such artifice was actually practised; and by whom? —by no other than the immaculate and conscientious Mr. Bartholomew, the violent and ultra anti-competitionist, who, in another edition of his book—should it ever reach one—may now bring forward some examples of the manœuvres practised in the competition for the Kentish Town Church.

Without any additions, however, there is enough and more than enough in his book at present, to convict the author of the "Specifications" of the most flagrant inconsistency. Or are we to suppose that he purposely left himself a loophole to creep out of, in the remark, that "what every respectable architect who has any real professional business to attend to, thinks of competition, may be gathered from the well-known fact, that none such is found to send in a competition design, unless he possess, or fancy that he possess, *direct influence for obtaining the prize!*" After this, we are compelled to suppose that Mr. Bartholomew would not have entered into the competition in question at all, had he not good reason to imagine beforehand that the prize would be secured to him by influence behind the curtain. It seems, therefore, after all, that violent as he is against competitions in general, he has no objection whatever to enter into one, provided he knows that it is a mere mockery as far as others are concerned, and that however superior may be the merit of other designs, the preference will be awarded to his own! He has now put beyond all doubt that he had but one inducement, and that founded upon what is most corrupt in the whole system of competition; upon that which really brings it into disgrace, and renders it nothing better than a system of dishonesty and intriguing—where one is to be favoured, and all the rest are to be duped—being invited to throw away their time in making drawings for what is arranged and all but finally settled beforehand. In the Kentish Town affair, however, there is something to console those who have been duped and disappointed; for not only is it a consolation, but even a triumph to find that Mr. Bartholomew's anti-competition rigour has thawed and melted away—probably owing to the late very hot summer; and that he has to all intents and purposes publicly recanted the furious invectives he has uttered against competition in his book. Therefore, those last now stand for nothing—except as so many proofs of his singular sincerity and consistency.

I remain, &c.,

NOT A. B. BUT B DUPED.

THE INVENTOR OF THE DREDGING MACHINE.

SIR—I observe, with some surprise, from a review in your Journal of last month, that you still consider the claim of the inventor of dredging by steam power to be amongst the number of those which are not yet satisfactorily established. You refer to a paper in the *Civil Engineer and Architect's Journal*, for January, 1839, wherein the invention is unreservedly ascribed to my grandfather, John Hughes, and during the four years which have elapsed since the publication of that paper, no syllable has ever been advanced in opposition to this claim—a fact which carries with it peculiar weight to the minds of those who, like myself, are fully aware of the very large circulation which your Journal commands. An individual, however, has at last thought proper to assert—I am willing to believe without the sanction of Messrs. Rennie—that the dredging machine is the invention of the late Mr. Rennie, their father, who first used it at the Hull Docks. In commenting upon this assertion, you observe truly, that a very important fact is not mentioned, namely, the year in which Mr. Rennie first introduced it at the Hull Docks. I shall, therefore, supply this omission in order that you, Sir, and the readers of the Journal, may estimate the value of the assertion thus rashly hazarded by a self-constituted champion of Mr. Rennie. It will be found that the first steam dredging engine employed at Hull was that used for cleansing out the Humber Dock, which was not opened till the 30th of June, 1809; and the following passage from Mr. Timperley's account of this dock will fix the time at which the engine was first used.

"This dock was not cleansed for three years and a half after it was opened, *the dredging machine and mud boats not being completed until then.*"[1] Hence it appears that the dredging machine could not have been employed at Hull before the end of 1812 or the beginning of 1813.

While this is the fact with respect to Mr. Rennie's claim, I am in possession of a report by my grandfather, dated in 1820, where he describes minutely every particular of his invention of the engine, and first employment of her at Woolwich, as far back as the year 1804; and not until it can be shown that the engine was invented before this last date will the claim of my ancestor be at all invalidated. I believe that Messrs. Rennie have far too high a respect for honour and truth to dispute for one moment a fact with which their respected father must have been so perfectly well acquainted, as that of the invention of the machine, and her first employment by my grandfather at Woolwich, in the year 1804. At the same time, it is possible that a person less intimately acquainted than they must be with the history of an invention of this nature, might be misled by the fact that dredging machines, on the old bag and spoon principle, were employed at Hull 50 or 60 years ago. It is even admitted, that a bucket engine worked by horses, was used at Hull from about the year 1782. This engine was probably the work of Mr. Rennie. That it bore no resemblance however to the modern steam dredging engine is abundantly proved by the fact, that many years after the horse machine was erected at Hull, the application of steam power to the dredging engine was unsuccessfully attempted by Trevethick and many other able engineers. Had Mr. Rennie's machine of 1782, been anything like the steam dredging engine, the simple application of steam could scarcely have baffled the exertions of so great a man as Richard Trevethick, with others of his contemporaries.

With respect to your observation "that the late Mr. Rennie, together with his talented sons, have brought the machine to that great perfection it has now attained," I would simply remark, that the engine built by Messrs. Donkin for William Hughes of Inverness, and used by him on the Caledonian Canal, was the most perfect ever constructed. See accounts of this engine in Baron Dupin's work on the resources of Great Britain, in your *Journal* for January 1839, and in a paper read before the Institution of Civil Engineers during the last session.

I am, Sir,

Your obedient servant,

8, *Duke Street, Westminster*, SAMUEL HUGHES.
December 15th, 1842.

AMERICAN MARINE STEAM ENGINES.

SIR—A late number of your *Journal* contained some remarks concerning American Marine Steam Engines, which were in a spirit very unlike the usual tone of the English press in descanting upon "Brother Jonathan's" available genius in such matters. Candid, fair, impartial criticism, no matter how close it may chance to "cut," will do much towards removing those mutual prejudices which unhappily exist to such an extent, that the mere imprint of "American" or "English," is oftentimes of itself sufficient to place the merits of any work without the pale of respectful controversy.

This should not be; there is not the least of necessity or of policy in being thus deprived of the benefits of each other's experience; as advantages in some shape or other, most undoubtedly belong to each, and only require to be known in order to be secured. As an illustration, might be adduced the acquaintance already formed through the establishment of your Trans-atlantic Steam Navigation Companies. One or two instances will suffice. In the English marine engine we see a connecting rod 15 feet long, and 10½ inches diameter, subjected to the same direct stress with the connecting rod of the American engine, and which is 24 feet long and 6 inches diameter; two thirds *less in area*, and one third *greater in length*, and yet performing equally well the same labour! By this, we are taught, that

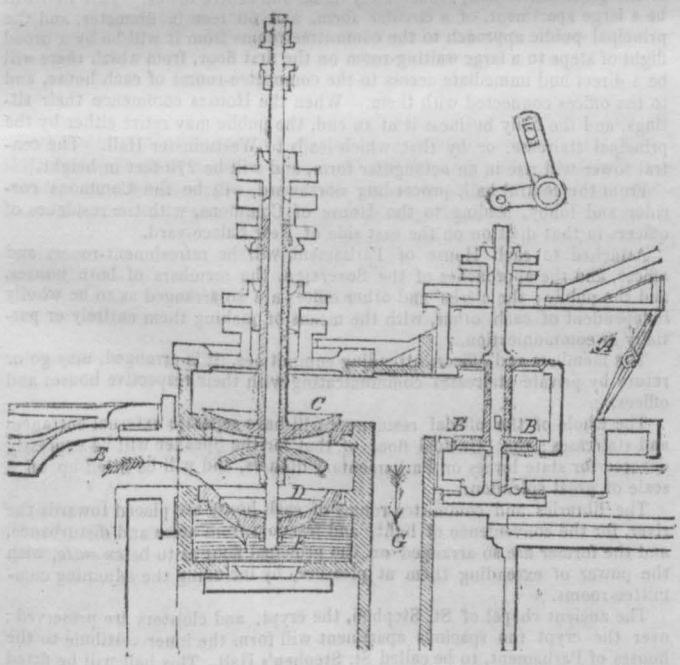
[1] See Mr. Timperley's account of the Harbour and Docks at Kingston-upon-Hull. Transactions of the Institution of Civil Engineers, vol. 1, p. 22.

while the English engines are certainly at *one extreme*, we are probably at the other. Again; the *Great Western*, if you please, comes over here with decks as "clean" as a "man of war," and returns with the singular notion, that on her quarter deck, can be erected, at a trifling expense, a saloon equal in every respect—and superior in many—to the one below, and making an addition to her accommodations equal to one third of all her cabin room below deck!

Notwithstanding the unequalled degree of perfection to which steam navigation upon our rivers has attained—excepting, of course, the great river of the west—the impression is very prevalent abroad, that in the attempt to compete with the "Lion of the seas," we shall be found wanting—an impression unfortunately, most consistent with a certain illegitimate specimen of 'Yankee enterprise," which has recently visited your shores. We think, however, that the time is not far distant when, with a ship exceeding in length the ordinary proportion, with engines having greater length of stroke so as to admit of working steam at a greater pressure without adding weight to the working parts, with paddle wheels large in diameter, very narrow, and making revolutions not less than 20 per minute; and with boilers adapted to a pressure of 15lb. to 20lb., we shall be able somewhat to "shorten the distance" which separates us from the "land of our fathers." Certain it is, that our ship-builders and engineers will not be satisfied with a steamer which will require, for a passage to Liverpool, more than *ten days* of good weather.

You were pleased to notice in a favourable manner the engines of the Spanish steamers *Regent* and *Congress*, built by the late firm of Ward, Stillman and Co., of the Novelty iron works, New York, and to intimate a wish to have the details of their arrangement. In answer to which, I take pleasure in sending to you a detailed account of those vessels, together with so much of a drawing of their engines, as will answer the purpose of your inquiry, and which I am authorized to do by Messrs. Stillman and Co.

VIEW OF THE UPPER VALVES.



A, Throttle valve. B, Expansion valve. C, Steam valve. D, Exhaust valve. E, Upper part of cylinder. F, Exhaust pipe. G, Steam pipe to lower valve.

Vessels:—	Feet.	Inches.
Length on deck	154	0
Breadth	30	8
Ditto at water line	28	8
Depth of hold	14	6
Draft of water	8	6
Burthen	671 tons.	

Frame of white oak, live oak, locust and cedar. The floor of white oak, laid close and caulked inside and out. Planked with white oak; fastened throughout with copper thorough bolts, composition spikes and locust treenails.

Engines:—
Diameter of cylinders 42½ inches.
Length of stroke 4 feet 7 inches.
Diameter of paddle wheels 18 feet.
Length of board 7 feet 6 inches, and width 2 feet 6 inches.
Pressure of steam 10lb.
Number of revolutions per minute 26.
Total weight of engines, wheels and boilers 100 tons.
Two copper boilers 22 tons.
Length of boilers 14 feet, height 9 feet, and breadth 8 feet.
Total of fire surface 1400 feet.
Speed of vessels 10 miles per hour.
Cost of vessel, engines and boilers, about 150,000 dollars.

It would be trifling, I fear, with the patience of your readers, to enter into a detailed description of the drawings, representing, as they do—with one or two exceptions—but an "old acquaintance," the "side lever engine;" the principal deviation from which, is the steam valves, and perhaps the air-pump bucket. The valves are shown in the section in the same position as in the drawings you refer to as having received, and which has recently been published in the London *Mechanics' Magazine*. As to the merit of this arrangement of the valves, I will not now offer an opinion, except that they are not generally used here for large engines.

As English engineers—either from strict fidelity to the *opinions of Watt*, or from much actual *experience*—have held us guilty of divers "barbarisms," in our substitutions for the use of the "slide valve," I shall make this matter the subject of another communication, accompanied with a sketch of the most approved form of the "double" or "balance valve."

The bucket of the air-pump, as shown in the separate sketch, for aught I know, may not be peculiar to this country, nor is it universally adopted here; it has been found, however—in situations where the condensing water is free from sand—to be far more efficient and durable than any other in use.

The "bilge injection," shown near the bottom of the condenser, is here thought to be an essential part of the engine of every steam vessel. And instances have occurred in which the use of it has been attended with the saving of much life and property.

With your permission, I will from time to time furnish your readers with notices—accompanied with drawings—of such improvements in American engineering, as may be thought interesting, or of such of its features as are not familiar to our transatlantic brethren generally.

I am, Sir, &c.,

New York, July 1842. F. W. S.

In our Journal for June last, we noticed that the Spanish government had ordered, and obtained from New York two war steamers, named the "Regent" and "Congress," and in commenting thereon we observed, we wished some further information before we gave any opinion on the subject; we were favoured with a lithographed external view of the engines, but we desired to look below the surface. Our wish has now been complied with, we are in possession of an apparently perfect section of the engines of the *Regent* and *Congress* steam ships, together with F. W. S.'s remarks thereon, and which we now publish. We thank him, and think, if his intentions are supported by engineers of the Old and New World, it will do much towards the explosion of prejudice, the extension of knowledge, and general good of mankind; that we heartily co-operate in this view, we plainly avow, as in fact our remarks in our last December number fully prove. We are, therefore, surprised at the opening paragraph of our correspondent, and we are unconscious of having admitted any thing into our columns which could offend his taste. If we have descanted upon "Brother Jonathan," it was more in playfulness than anger, not as an opposing race, but as descendants of one common stock, to which *genius* is common. We think, however, our correspondent's reprehensions are misapplied, as we do not recollect using the phrase *he* complains of. With this exordium we at once proceed to an analysis and consideration of the engines of the *Regent* and *Congress*.

The engines are of the *beam* kind, and scarcely to be distinguished from those of the *Megæra* by Seaward, published by Weale in his Tredgold, pl. 49, vol. 2. The *architecture* is very similar to the engines of the *Tiger*, by Edward Bury. (See Tredgold, vol. 2, plates 110 and 110 a.) In one point they differ, in the use of circular valves instead of the D or Murdock slide, and in this it resembles another emanation of American intellect, called the *Royal William* (now *Isabella II.*) which made the voyage to England in 1832, and subsequently figured in the Spanish war.

The cylinders are 42½ inches diameter and 4 ft. 7 in. stroke; at 26 strokes or 238 feet the power is equal to 71½ horses each, or 143 horses collectively. This is nominal power as calculated by the rules of the late Mr. Watt, applicable to steam of 2½ or 3 lb. per inch, but in this case we have a pressure on the safety valve of 10 lb. per square inch, so that the *actual* power will probably be 150 per cent. above this, depending entirely upon the expansion used, and we may further observe, that with a suitable arrangement, circular valves may be made to produce any degree of expansion, at pleasure. The air pump is 22 inches diameter, and about 2 ft. 6 in. stroke, = a content of 6·6 cubic feet. Cylinder 42½ in. × 4 ft. 7 in. long = 49·46 feet content, which divided by 6·6, makes the cylinder 7·5 times larger than the pump, just the usual proportions of English engines. The condenser is 2 ft. 5 in. fore and aft, 3 ft. 5 in. in width, and 4 ft. high, with proper deductions is equal to a content of 24 cubic feet, and 71·5 ÷ 24 = nearly 3 cubic feet per H.P. The circular steam valves are 11½ in. diameter = 103·86 area, the eduction valves are 10 in. diameter = 78·54 area, or rather more than a square inch per horse, a very ample allowance, and much exceeding Mr. Watt's rules, as will be seen by reference to Farey and other works, but taking into consideration the increased density of the steam employed, is judicious, and about on a par with modern *slide* valve practice. Our correspondent is wrong in supposing that English engineers have adhered to the slide valve "from strict fidelity to the opinions of Watt." It is otherwise; they have departed therefrom and followed Murdock, his disciple, who patented the D, triangular, or other shaped sliding valve, in his specification of 1790. (See Farey, p. 677.) We are at a loss, also, to find any novelty in the construction of the circular valves; they appear to us precisely similar to those used by Mr. Watt[1] in his engines of 1808. He used circular pipes, and here we have rectangular passages. (See Farey, plate 20.) We are equally obtuse respecting the air pump, of which we have an isometrical drawing, and can find nothing new therein; if our correspondent alludes to the packing ring similar to that of the piston, we may say that system has been followed in this country since the year 1826, perhaps earlier. The bilge injection is in the same category.

There is merit in the adaptation of a double beat expansion valve, though it is by no means new, and we think we can suggest an improvement, as the lower face can never be tight (see the annexed engraving). The other parts of these engines are so much like the best English practice, that it is needless to pursue the inquiry farther. The space occupied in the vessel for each engine is 16 ft. fore and aft, and about 5 ft. 9 in. over the main beams.

On the whole, we think the engines of the *Regent* and *Congress* to be highly creditable to Messrs. Ward, Stillman & Co., of New York, by whom they were manufactured, not only as evincing considerable judgment in detail, but more so, in their selection of the common beam engine, which, after all, appears to be the best kind yet produced.

THE NEW HOUSES OF PARLIAMENT.

THE fifth contract for erecting this national and truly magnificent work nas just been entered into, and Messrs. Grissell and Peto are again the successful competitors. This contract or portion of the work is by far the most important that has yet taken place, embracing as it does the Victoria Tower, the Royal Gallery, the Houses of Lords and Commons, with other important and necessary adjuncts thereto. The following particulars have been obtained:—

The Victoria Tower, or Royal entrance, necessarily occupies the first position in the arrangement, whether as regards the order of description or the magnitude of its structure, which perhaps will be one of the richest and most gigantic specimens of Gothic architecture that this or any other country can boast. Beneath this tower the Royal entrance will be formed, presenting an area of 60 feet square, into which the Royal and other state carriages will be enabled to drive with the most perfect ease, turn round at the foot of the Royal staircase, and depart at the entrance on the south side. The upper stories of the tower will be used as secure depositories for public records and state documents. The external square of the tower will be 78 feet at the principal floor level, from which point it will be ornamented with the richest specimens of Gothic sculpture to the height of 240 feet, reaching to the base of the four crowned turrets by which it will be surmounted. The entire height, from the bottom of the tower to the top of the turrets, will be 300 feet.

The Royal entrance-hall or vestibule is the next object of interest included in the present contract, and will be approached from the right-hand side of the tower, leading from the principal staircase to the Royal Gallery.

[1] Or rather his successors, Boulton and Watt. Mr. Watt retired from business in 1800.

For the Royal Gallery, the next in order, no pains have been spared on the design to render this portion of the edifice of surpassing richness and magnitude. The upper part of the walls will be of the most elaborately-sculptured designs of Gothic ornaments, while the lower portion of the walls is divided into compartments intended for the reception of the most exquisite subjects in fresco painting.

The Royal Robing-room will be next approached from the Royal Gallery, and will strictly harmonize with the fittings and ornaments of the latter. It will be a most splendid apartment, 40 feet in length and 30 feet in width, immediately adjoining the house of Lords, with entrances for the Sovereign on each side of the throne.

The Bishops' Robing-room, a large apartment on the right-hand side of the Robing-room of Her Majesty, will be appropriated to the use of the spiritual peers.

The House of Lords comes next in the order of arrangement, and will be situate on the principal story, preserving a level throughout with the old floor of St. Stephen's Chapel, so that the entrance for the peers may either be obtained along the corridors from the river front, or by that leading from Old Palace-yard. The size of the House of Lords, as well as that of the House of Commons, will be reduced to the smallest possible limits compatible with the required accommodation, and to give them that form and arrangement which will afford the greatest number of sittings in the smallest space, bring the members nearest to each other and to the speaker, and be the most convenient for carrying on the ordinary routine of business.

The two houses will be placed as nearly as possible in the centre of the whole mass of buildings, this being considered the position best adapted for communication with each other, and with their respective offices and accommodations; for easy access from the various entrances and approaches, public and private; for security from noise and disturbance; for allowing their form and size to be exactly fitted to the wants of each house; for the purposes of lighting, warming, and ventilating in the most convenient manner; and for making any modifications or alterations in them which may be thought desirable without deranging the general plan and elevations.

It has been thought proper to avoid placing any members' seats under the galleries, as well as any seats whatever behind the woolsack or the Speaker's chair.

From the House of Lords a spacious lobby and corridor will lead directly to the great centre hall, immediately under the centre tower. This hall will be a large apartment, of a circular form, and 60 feet in diameter, and the principal public approach to the committee-rooms from it will be by a broad flight of steps to a large waiting-room on the first floor, from which there will be a direct and immediate access to the committee-rooms of each house, and to the offices connected with them. When the Houses commence their sittings, and the daily business is at an end, the public may retire either by the principal staircase, or by that which leads to Westminster Hall. The central tower will rise in an octangular form, and will be 270 feet in height.

From the central hall, proceeding northward, will be the Commons' corridor and lobby, leading to tho House of Commons, with the residence of officers in that division on the east side of New Palace-yard.

Attached to each House of Parliament will be refreshment-rooms and offices, and the approaches of the Sovereign, the members of both houses, and the public; the clerks' and other offices are so arranged as to be wholly independent of each other, with the means of making them entirely or partially in communication.

The members and officers attending committees, it is arranged, may go or return by private staircases communicating with their respective houses and offices.

The whole of the official residences will have separate external entrances and staircases; the principal floor of that for the Speaker will be expressly devoted for state levees or Parliamentary dinners, and will be fitted up on a scale of great splendour.

The libraries and committee-rooms of each house are placed towards the river, for the convenience of light, and freedom from noise and disturbance, and the former are so arranged on the principal floor as to be *en suite*, with the power of extending them at pleasure, by including the adjoining committee-rooms.

The ancient chapel of St. Stephen, the crypt, and cloisters are preserved; over the crypt the spacious apartment will form the inner vestibule to the houses of Parliament, to be called St. Stephen's Hall. This hall will be fitted up in the same style of ornament as the Royal Gallery and the corridors, with the introduction of choice subjects in fresco painting.

Another important feature will also be found in the construction of the two houses for the purpose of a complete and thorough ventillation. This department has been placed under the superintendence of Dr. Reid, who, after a variety of trials of different plans and experiments, has adopted a mode of ventilation by which not only the houses of Parliament but every apartment and office connected therewith may, it is said, be regulated at pleasure. It is proposed that the three great towers shall be made available for this purpose, and from a certain height that the masonry of them shall be hollow, and pierced in several places for the reception and egress of air. According to the state of the wind, air might be received from the Victoria or clock towers, which will occupy the northern and southern extremeties. The form of the Victoria Tower has been already described; the clock tower will also be of the square form, finishing spirally, and of the height of 270 feet. The air thus obtained will be forced by machinery through the vaults under the body of the whole edifice, thence it will be discharged by means

of chambers to the body of both houses, extending to the Royal Gallery and the main and entire portions of the buildings. After passing through the various apartments the air will be received by means of perforated ceilings into chambers to be fitted above the roofs, and will be carried off up the central tower.

The works that are already in progress on the eastern or river front are in a great state of forwardness, and will, when completed, extend to 870 feet in length. The ground floor embraces repositories and offices, and the principal one, the Lords' and Commons' libraries, committee-rooms, the conference-hall, and the public and private corridors. The south front will be 340 feet long, that portion next the river being appropriated as the residence of Sir Augustus Clifford, the Usher of the Black Rod. The opposite front, on the northern wing, will comprise the residence of the Speaker of the House of Commons, the Sergeant-at-arms, and other officers.

The external works of the first and principal stories on the river front, including the Lords' and Commons' river entrances, are nearly completed, and the decorations are of the most extensive character. The northern and southern fronts are ornamented with elaborately-sculptured niches in which are placed statues of the various kings who reigned in England prior to the Conquest.

Along the whole eastern front, immediately under the principal floor windows is an ornamented band, on which is displayed in strong relief, in old English characters, the names of every sovereign who has reigned in England since the Conquest, commencing in chronological order with William the Conqueror, and terminating with that of William IV., and above each are the Royal arms of England richly sculptured.—*Standard.*

LAW PROCEEDINGS.

HOARD NUISANCE.

In the Court of Queen's Bench, Friday, December 2nd. (Sittings at Nisi Prius at Westminster, before Mr. Justice Coleridge and a Special Jury.)

MURRAY *v.* ELGAR.

The Solicitor-General, Mr. Platt, and Mr. M. Smith, conducted the case for the plaintiff; and Mr. Thesiger, Mr. Dundas, and Mr. Watson, that of the defendant.

This was an action brought by a gentleman residing at No. 16, George-street, Hanover-square, to recover compensation for the injury which he had sustained by reason of the defendant having erected a "hoard," for which some open boarding had been afterwards substituted.

It appeared that the premises occupied by the plaintiff abutted on those occupied by the defendant, who, in 1839, had erected the hoard in question, for which the open boarding had been substituted, within 10 feet of the dining-room windows of the plaintiff. The object was not to recover damages, but to get rid of the nuisance. The servants who had lived in the plaintiff's family before and after the erection of this obstruction, stated that the light in the lower rooms of the house had been considerably diminished, that the walls had become damp in consequence of the free circulation of air beingimpeded, and that the provisions in the larder had frequently been spoiled from the same cause. Several architects and surveyors gave it as their opinion that the value of the house was diminished by one-third, and Dr. Ure stated that he had performed several experiments which convinced him that the light in the plaintiff's dining-room had undergone a diminution of six degrees by the erection of the hoard, and three degrees by the open boards. Mr. Facey corroborated Dr. Ure's evidence, and the medical attendant of the family deposed that Mrs. Murray's health had suffered materially in consequence.

Mr. Thesiger contended that the plaintiff had no right to recover for any loss of prospect or comfort, and that the evidence as to the obstruction of light and air was most unsatisfactory.

Mr. Justice Coleridge having summed up,

The Jury found for the plaintiff, with nominal damages.

PROFESSIONAL CHARGES.

In the Court of Queen's Bench, Friday, December 2nd. (Sittings at Nisi Prius at Westminster, before Mr. Justice Coleridge and a Common Jury.)

DOBSON *v.* CROZIER.

Mr. Platt and Mr. C. Clark were counsel for the plaintiff; and Mr. Whateley and Mr. Petersdorff for the defendant.

This was an action to recover £54 5*s.* 6*d.*, for work and labour done by the plaintiff, who is an architect.

It appeared that the plaintiff had drawn up certain plans and specifications for the erection of a house for the defendant, for which tenders had been offered by builders, but which plan had not been carried into effect. He had subsequently drawn other plans and specifications, from which the house had been erected. The defendant had paid £35 into court, being 5 per cent. on the money expended in carrying into execution the accepted plans. The plaintiff claimed in addition £10 for his trouble in drawing the rejected plans, and some other items, making together the sum of £53, for which the action was brought.

Several surveyors were called for the defendant, who stated it was the custom of the profession to charge 2½ per cent for rejected plans, but they disallowed all items but that charge.

For the defendant it was contended that the plaintiff had not proved that the plans had been rejected through the caprice of the defendant, and therefore it must be taken that the plans were inapplicable.

The learned Judge having summed up, the jury returned a verdict for the plaintiff for 9*l.* 10*s.*, in addition to the money paid into court.

BLACKWALL RAILWAY.—INFRINGEMENT OF PATENT.

In the Court of Queen's Bench, Monday, December 19th. Before a Special Jury.

CURTIS *v.* THE DIRECTORS.

This was an action for the alleged infringement of a patent which had been taken out by the plaintiff, for connecting and disconnecting the draught or gronnd rope of a railway, with railway carriages, when the rope was in motion. The plan was specially applicable to railways where the carriages were drawn, as on the Blackwall Railway, by means of a rope moved by an engine placed at the spot, towards which the carriages were desired to be drawn. The defendants had adopted a plan for effecting this purpose, which it was alleged was essentially the same as that invented by the plaintiff. The defence was, that the plans were not the same, and that that which was in use on the Blackwall Railway had been suggested to the directors some time before the specification of the plaintiff was published. There was a good deal of evidence given as to the practicability of ever attaching a rope to a railway carriage when the rope was in motion, and much doubt was thrown upon the possibility of such a performance; but a person, named Barn, stated that he had twice done it when in the service of the Blackwall Railway Company; once when, in coming up to London, the rope accidentally got detached, and once at the Limehouse station, when no passengers were in the carriage, for the purpose of an experiment. He, however, said, that it required a "good man" to do it, and the appearance of the witness showed that he came within this expression, in the particular meaning he attached to it. Witnesses having been examined on both sides, the cause, which had occupied the whole of the day, was terminated by the jury interfering, and stating that they were of opinion the powers used by the two parties were not the same, when the plaintiff consented to be non-suited.

ROYAL EXCHANGE.

We hope it may not turn out that there was more of hurry than good speed manifested in the competition for the sculpture that is to adorn the pediment of the portico. Quick work it certainly was, when after being sent in on the evening of the preceding day, the designs were "examined"? on the 25th November, and the ballot-box brought into play instanter; the majority of votes being in favour of Mr. Westmacott—whom rumour had previously marked out as *likely* to be the *fortunate* competitor. After so much has been said relative to the manner in which competitions are managed and mismanaged, it might have been thought that at any rate a little more tact and adroitness would have been employed on this occasion. Whether such was really the case or not, it certainly now *looks* as if it had been a preconcerted affair; for hardly is it possible to suppose that the committee could competently judge off-hand of the merits of the designs as works of art—unless indeed the one chosen was so evidently superior to the two others, as to have no room for doubt or question—which is not very probable. We ourselves saw one of the rejected designs, or rather two different designs by Mr. Watson, the artist who has lately given such public proof of his ability in the bas-relief of the new Commercial Hall in Threadneedle Street; and having seen them, we certainly doubt very much at present if the one "*selected*" be—we will not say of greater, but of equal merit. Upon Hamlet's principle of "Assume a virtue, if you have it not," there might have been the appearance of a little deliberation; there might have been an interval of three or four weeks, during which, artists and those known to be judges of art should have been allowed to inspect the designs, and public opinion in regard to them, so far taken, and taken also into consideration. Possibly the one which is to be executed is the best design, and so too, might the best design have been the winner, had the matter been decided by lottery. If it be worth while to bestow so considerable a sum as Three Thousand Guineas or Pounds on the decoration of the pediment, it was surely worth while to bestow far more scrupulous attention upon the design itself, beforehand than now appears to have been done. However, the Gresham Committee have, in this instance, shown themselves to be men of business and dispatch, who can make up their minds very quickly, without any nonsensical "shilly-shallying." Still, with all our misgivings, we are willing to hope for the best; though as poor Mrs. Nickleby says, "we ought never to be over and above *sanguinary* in our expectations!"

THE FINE ARTS.—THE ROYAL ACADEMY.

On Saturday, the 10th ult., there was a very numerous meeting of the members of the Academy, in Trafalgar-square.

Sir Martin Archer Shee was in the chair; and there were present Sir R. Westmacott, Sir W. Ross, A. Cooper, R. Cooke, H. P. Briggs, W. Etty, C. L. Eastlake, P. Hardwicke, D. Maclise, W. Mulready, T. Unwin, W. Wyon, W. Collins, E. Landseer, C. R. Leslie, J. M. W. Turner, C. R. Cockerell, J. J. Chalon, W. T. Witherington, D. Roberts, E. H. Bailey, and A. E. Chalon, members of the Academy.

At nine o'clock the President commenced the business of the evening, by stating the objects the Academy had in view, by giving those annual rewards to the students who gave tangible proofs of talent, vigilance, and application in the various classes of drawing, painting, sculpture, and architecture; and he then went into a detail of the merits displayed in the respective classes, to all of which, except that of models from the life subject, the medals were cheerfully given by the Council; and the reason for not giving a medal in that class. arose from there only being one candidate, and therefore there could be no competition. The merits of the chalk drawings made from the living models, and from the antique statues, were mentioned in terms of high commendation by the President, who observed emphatically, that the style of drawing these difficult objects had considerably improved within the last two or three years, which he stated arose from the alterations made, deviating from the late method, and which had been judiciously made by the present keeper of the Academy. To the copies in oil from Guido's picture of "Fortune," the President gave high and deserved commendation, as well as to the architectural plans, elevations, and sections of the beautiful Church of Walbrook.

The prizes were then distributed in the following order, viz.:—

To Mr. James Clarke Hook, for the best copy made in the school of painting, the silver medal, with the lectures of the Professors Barry, Opie, and Fuseli.

To Mr. Alfred Rankley, for the next best copy made in the painting school, the silver medal.

To Mr. J. C. Hook, for the best drawing from the living models, the silver medal.

To Mr. John Clayton, for the best drawings of the ground plan, sections, &c., of St. Stephen's Church, Walbrook, the silver medal.

To Mr. James Harwood, for the best drawings from the antique, the silver medal.

To Mr. Alfred Gatley, for the best model from an antique statue, the silver medal.

After the delivery of the prizes, the President concluded the public business of the evening with an address from the chair, which was replete with the soundest practical observations upon the state, condition, and prospects of the arts in this country. We regret that our limits do not allow us to give a full report of this able and eloquent discourse; but amongst the points he touched upon with energy and feeling were, that unworthy and groundless prejudice that still remains in the minds of a few of the noble and wealthy classes in England, which would place foreign modern arts far above that of Great Britain, even at the present day. This morbid desire to set up every country above their own in matters of an intellectual nature, was far more commonly entertained some years since in England than it has been of late; we have done our part in demolishing this unnatural, this monstrous doctrine, and it has been damaged irretrievably. After the President had clearly and with much energy pointed out the gross absurdities and contradictions of the few anti-national connoisseurs who still exist, he properly noticed another unnatural practice which militates against the arts of the United Kingdom—namely, the vituperation poured forth *pleno flumine* by the minor press, generally, against the native artists and their works. The President went into many topics professionally interesting, and, on concluding his address, was warmly applauded.

The general assembly then proceeded to appoint officers for the ensuing year, when Sir Martin Archer Shee was unanimously elected President.

Council. New List.—Messrs. Charles Barry, George Jones, Alfred E. Chalon, and Thomas Phillips.

Old List.—Messrs. Philip Hardwick, David Roberts, John James Chalon, and William Mulready.

Visitors in the Living Model Academy, New List.—Messrs. Edward H. Bailey, Alfred E. Chalon, Richard Cook, and William Frederick Witherington.

Old List.—Messrs. Charles Robert Leslie, William Mulready, Thomas Uwins, and W. Wyon.

Visitors in the School of Painting, New List.—Messrs. Henry P. Briggs, Charles L. Eastlake, Charles Robert Leslie, and Thomas Uwins.

Old List.—Messrs. W. Collins, W. Etty, Edwin Landseer, and David Roberts.

Auditors re-elected.—Messrs. William Mulready and J. M. W. Turner, and Sir R. Westmacott.

THERMOGRAPHY.

Art of Copying Engravings, or any Printed Characters from Paper on Metal Plates; and on the Recent Discovery of Moser, relative to the Formation of Images in the Dark. By MR. ROBERT HUNT. *Read at the Meeting of the Cornwall Polytechnic Society, on the 8th Nov. of which excellent Society Mr. Hunt is the secretary.*

THE Journal of the Academy of Sciences of Paris, for the 18th of July, 1842, contains a communication made by M. Regnault, from M. Moser, of Konigsberg, "Sur la formation des images Daguerriennes;" in which he announces the fact, that "*when two bodies are sufficiently near, they impress their images upon each other.*" The Journal of the 29th of August contains a second communication from M. Moser, in which the results of his researches are summed up in 26 paragraphs. From these I select the following, which alone are to be considered on the present occasion:—"All bodies radiate light, even in complete darkness.—This light does not appear to be allied to phosphorescence, for there is no difference perceived whether the bodies have been long in the dark, or whether they have been just exposed to daylight, or even to direct solar light.—Two bodies constantly impress their images on each other, even in complete darkness. However, for the image to be appreciable, it is necessary, because of the divergence of the rays, that the distance of the bodies should not be very considerable.—To render the image visible, the vapour of water, mercury, iodine, &c. may be used.—There exists *latent light* as well as latent heat."

The announcement at the last meeting of the British Association of these discoveries, naturally excited a more than ordinary degree of interest. A discovery of this kind, changing, as it does, the features, not only of the theories of light adopted by philosophers, but also the commonly received opinions of mankind, was more calculated to awaken attention than anything which has been brought before the public since the publication of Daguerre's beautiful photographic process. Having instituted a series of experiments, the results of which appear to prove that these phenomena are not produced by *latent light*, I am desirous of recording them.

I would not be understood as denying the absorption of light by bodies; of this I think we have abundant proof, and it is a matter well deserving attention. If we pluck a Nasturtium when the sun is shining brightly on the flower, and carry it into a dark room, we shall still be enabled to see it by the light which it emits. The human hand will sometimes exhibit the same phenomenon, and many other instances might be adduced in proof of the absorption of light; and I believe, indeed, of the principle that light is latent in bodies. I have only to show that the conclusions of M. Moser have been formed somewhat hastily, being led, no doubt, by the striking similarity which exists between the effects produced on the Daguerreotype plates under the influence of light, and by the juxtaposition of bodies in the dark, to consider them as the work of the same element.

1. Dr. Draper, in the Philosophical Magazine for September 1840, mentions a fact which has been long known, that "if a piece of very *cold* clear glass, or what is better, a *cold* polished metallic reflector, has a little object, such as a piece of metal, laid on it, and the surface be breathed over once, the object being then carefully removed, as often as you breathe again on the surface, a spectral figure of it may be seen, and this singular phenomenon may be exhibited for many days after the first trial is made." Several other similar experiments are mentioned, all of them going to show that some mysterious molecular change has taken place on the metallic surface, which occasions it to condense vapours unequally.

2. On repeating this simple experiment, I find that it is necessary for the production of a good effect, to use dissimilar metals; for instance, a piece of gold or platina on a plate of copper or of silver, will make a very decided image, whereas, copper or silver on their respective plates give but a very faint one, and bodies which are bad conductors of heat placed on good conductors, make decidedly the strongest impressions when thus treated.

3. I placed upon a well polished copper plate, a sovereign, a shilling, a large silver medal, and a penny. The plate was gently warmed by passing a spirit lamp along its under surface; when cold, the plate was exposed to the vapour of mercury; each piece had made its impression, but those made by the gold and the large medal were most distinct; not only was the disc marked, but the lettering on each was copied.

4. A bronze medal was supported upon slips of wood, placed on the copper, one-eighth of an inch above the plate. After mercurialization, the space the medal covered was well marked, and for a considerable distance around the mercury was unequally deposited, giving a shaded border to the image.

5. The above coins and medals were all placed on the plate, and it was made too hot to be handled, and allowed to cool without their being removed; impressions were made on the plate in the following order of intensity, gold, silver, bronze, copper. The mass of the metal was found to influence materially the result; a large piece of copper making a better image than a small piece of silver. When this plate was exposed to vapour, the

results were as before (3, 4). On rubbing off the vapour, it was found that the gold and silver had made permanent impressions on the copper.

6. The above being repeated with a still greater heat, the image of the copper coin was, as well as the others, most faithfully given, but the gold lead, and silver only made permanent impressions.

7. A *silvered* copper plate was now tried with a moderate warmth (3). Mercurial vapour brought out good images of the gold and copper; the silver marked, but not well defined.

8. Having repeated the above experiments many times with the same results, I was desirous of ascertaining if electricity had any similar effect; powerful discharges were passed through and over the plate and discs, and it was subjected to a long continued current without any effect. The silver had been cleaned off from the plate (7), it was now warmed with the coins and medals upon it, and submitted to discharges from a very large Leyden jar; on exposing it to mercurial vapour, the impressions were very prettily brought out, and strange to say, spectral images of those which had been received on the plate when it was silvered (7). Thus proving that the influence, whatever it may be, was exerted to some depth in the metal.

9. I placed upon a plate of copper, blue, red, and orange coloured glasses, pieces of crown and flint glass, mica, and a square of tracing paper. These were allowed to remain in contact half an hour. The space occupied by the red glass was well marked, that covered by the orange was less distinct, but the blue glass left no impression: the shapes of the flint and crown glass were well made out, and a remarkably strong impression where the crown glass rested on the tracing paper, but the mica had not made any impression.

10. The last experiment repeated; after the exposure to mercurial vapour, heat was again applied to dissipate it, the impression still remained.

11. The experiment repeated, but the vapour of iodine used instead of that of mercury. The impressions of the glasses appeared in the same order as before, but also a very beautiful image of the mica was developed, and the paper well marked out, showing some relation to exist between the substances used and the vapours applied.

12. Placed the glasses used above (9, &c.), with a piece of well smoked glass, for half an hour one-twelfth of an inch below a polished plate of copper. The vapour of mercury brought out the image of the smoked glass only.

13. All these glasses were placed on the copper, and slightly warmed; red and smoked glasses gave, after vaporization, equally distinct images, the orange the next, the others left but faint marks of their forms; polishing with tripoli and putty powder would not remove the images of the smoked and red glasses.

14. An etching, made upon a smoked etching ground on glass, the copper and glass being placed in contact. The image of the glass only could be brought out.

15. A design cut out in paper was pressed close to a copper plate by a piece of glass, and then exposed to a gentle heat; the impression was brought out by the vapour of mercury in beautiful distinctness. On endeavouring to rub off the vapour, it was found that all those parts which the paper covered amalgamated with mercury, which was removed from the rest of the plates; hence there resulted a perfectly permanent white picture on a polished copper plate.

16. The coloured glasses before named (9, 12), were placed on a plate of copper, with a thick piece of charcoal, a copper coin, the mica, and the paper, and exposed to fervent sunshine. Mercurial vapour brought up the images in the following order—smoked glass, crown glass, red glass, mica beautifully delineated, orange glass, paper, charcoal, the coin, blue glass; thus distinctly proving, that the only rays which had any influence on the metal, were the calorific rays. This experiment was repeated on different metals, and with various materials, the plate being exposed to steam, mercury, and iodine; I invariably found, that those bodies which absorbed or permitted the permeation of the most heat, gave the best images. The blue and violet rays could not be detected to leave any evidence of action, and as spectra imprinted on photographic papers by light which had permeated these glasses, gave evidence of the large quantity of the invisible rays which passed them freely, we may also consider those as entirely without the power of effecting any change on compact simple bodies.

17. In a paper which I published in the *Philosophical Magazine* for October, 1840, I mentioned some instances in which I had copied printed pages and engravings on iodized paper, by mere contact and exposure to the influence of the calorific rays, or to artificial heat. I then, speculating on the probability of our being enabled, by some such process as the one I then named, to copy pictures and the like, proposed the name of Thermography, to distinguish it from Photography.

18. I now tried the effects of a print in close contact with a well-polished copper plate. When exposed to mercury, I found that the outline was very faithfully copied on the metal.

19. A paper ornament was pressed between two plates of glass, and warmed, the impression was brought out with tolerable distinctness on the under and warmest glass, but scarcely traceable on the other.

20. Rose leaves were faithfully copied on a piece of tin plate, exposed to the full influence of sunshine, but a much better impression was obtained by a prolonged exposure in the dark.

21. With a view of ascertaining the distance at which bodies might be copied, I placed upon a plate of polished copper, a thick piece of plate glass, over this a square of metal, and several other things, each being larger than the body beneath. These were all covered by a deal box, which was more than half an inch distant from the plate. Things were left in this position for a night. On exposing to the vapour of mercury, it was found that each article was copied, the bottom of the deal box more faithfully than any of the others, the grain of the wood being imaged on the plate.

22. Having found, by a series of experiments, that a blackened paper made a stronger image than a white one, I very anxiously tried to effect the copying of a printed page or a print. I was partially successful on several metals, but it was not until I used copper plates amalgamated on one surface, and the mercury brought to a very high polish, that I produced any thing of good promise. By carefully preparing the amalgamated surface of the copper, I was at length enabled to copy from paper line-engravings, wood-cuts, and lithographs, with surprising accuracy. The first specimens produced (which were submitted to inspection), exhibit a minuteness of detail and sharpness of outline quite equal to the early Daguerréotypes and the photographic copies, prepared with chloride of silver.[1]

The following is the process at present adopted by me, which I consider far from perfect, but which affords us very delicate images. A well polished plate of copper is rubbed over with the nitrate of mercury, and then well washed to remove any nitrate of copper which may be formed; when quite dry, a little mercury taken up on soft leather or linen is well rubbed over it, and the surface worked to a perfect mirror. The sheet to be copied is placed smoothly over the mercurial surface, and a sheet or two of soft, clean paper being placed upon it, is pressed into equal contact with the metal by a piece of glass, or flat board; in this state it is allowed to remain for an hour or two. The time may be considerably shortened by applying a very gentle heat for a few minutes to the under surface of the plate. The heat must on no account be so great as to volatilize the mercury. The next process is to place the plate of metal in a closed box, prepared for generating the vapour of mercury. The vapour is to be slowly evolved, and in a few seconds the picture will begin to appear; the vapour of mercury attacks those parts which correspond to the white parts of the printed page or engraving, and gives a very faithful but somewhat indistinct image. The plate is now removed from the mercurial box, and placed in one containing iodine, to the vapour of which it is exposed for a short time; it will soon be very evident that the iodine vapour attacks those parts which are free from mercurial vapour, blackening them. Hence there results a perfectly black picture, contrasted with the grey ground formed by the mercurial vapour. The picture being formed by the vapours of mercury and iodine, is of course in the same state as a Daguerréotype picture, and is readily destroyed by rubbing. From the depth to which I find the impression made into the metal, I confidently hope to be enabled to give to these singular and beautiful productions a considerable degree of permanence, so that they may be used by engravers for working on. It is a curious fact, that the vapours of mercury and of iodine attack the plate differently, and I believe it will be found that vapours have some distinct relation to the chemical or thermo-electrical state of the bodies upon which they are received. Moser has observed this, and attributes the phenomena to the colours of the rays, which he supposes to become latent in the vapour on its passing from the solid into the more subtile form. I do not, however, think this explanation will agree with the results of experiments. I feel convinced that we have to deal with some thermic influence, and that it will eventually be found that some purely calorific excitement produces a molecular change, or that a thermo-electric action is induced, which effects some change in the polarities of the ultimate atoms of the solid.

These are matters which can only be decided by a series of well conducted experiments. Although attention was called to the singular manner in which vapours disposed themselves on plates of glass and copper, two years since by Dr. Draper, Professor of Chemistry at New York, and about the same time to the calorific powers of the solar spectrum, by Sir John Herschel, and to the influence of heat artificially applied, by myself (17), yet it is certainly due to M. Moser of Konigsberg, to acknowledge him to be the first who has forcibly called the attention of the scientific world to an inquiry which promises to be as important in its results as the discovery of the electric pile, by Volta.

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[1] The first faithful copy of the lines of a copper plate engraving was obtained by Mr. Cantabrana, who has since succeeded in procuring some tolerable specimens on amalgamated copper which cannot be rubbed off.

NOTES ON EARTH WORK, EXCAVATION, CUTTING, AND FORMING EMBANKMENT UPON RAILWAYS.

ARTICLE IV.—SUPERINTENDENCE, ACCOUNTS, AND MEASUREMENTS.

"Modern practice has reduced it to a price per cubic yard."
Professor Vignole's Lecture, Dec. 1841.

IN pursuance of my promise given at the conclusion of my former paper, I shall now attempt to give a description of the methods in use during the execution of railways, as regards the supervision, both on the part of the Company and contractor. First, then, as to the engineering staff; we have parliamentary and consulting engineers, engineer in chief, resident, assistant, and sub-engineers, but the duties of the resident and assistant it will only be necessary for me to notice. The resident controls the whole line and the assistants, and confers with the Directors at all their meetings for finance, and when the line exceeds 50 miles in length, the duties will be so multiplied that two will be requisite. The assistants are subordinate to the resident, and have generally a division of 10 miles each, or perhaps a length of, say three contracts. The duties of an assistant is to observe that the works are executed according to plan, and that the materials are of proper quality, and if not so, to complain, first to the contractor, and if not attended to, then to the resident; to allow no change to be made in the dimensions without the sanction of the resident, and if any change is ordered, to ascertain the difference for or against the contractor jointly with him or his agent, to enter these measurements in a book, and to make a return monthly to the resident, as also of all materials received on the Company's account, as rails, chairs, keys, sleepers, blocks, &c. He is also to make a return each fortnight, of the number of men employed by the contractor, to measure works for monthly payments, and price them by the schedule attached to the contract. In taking the measurements, he will much facilitate his work by making them as near as possible to given points, so as to save re-measurements. He is also to see that all levels are executed with reference to bench marks and gradients given, and to preserve the centre or trig line, especially in curves, and to give the half width of railway, and to see that no more land is enclosed than has been purchased, and finally to be in frequent communication with the resident, and if any thing unexpectedly occurs, to lose no time in communicating it. From the above statement of duties, it will be seen that great responsibility is often placed on the shoulders of the assistant, partly owing to the distance that separates him from the resident.

The accounts in detail are in the province of the contractor, which will be hereafter considered. The assistant should have a knowledge of measuring land and artificer's work, as at the stations on the line he is brought into communication with slaters, joiners, masons, plumbers, &c. The supervision of a contract on the part of a contractor will consist of a superintendent, clerk, timekeepers, and foreman over each department of artificers. The superintendent sets out the works, and sub-lets them to the various gangers and butty gangs, and measures and prices their work; he also measures with the assistant engineer for the monthly payments. The clerk keeps the books, &c. and invoices. The foremen superintend their own trade, and examine the goods sent to the works, with the invoice, both as regard quality and quantity; they also send in a weekly return of all the men's time individually, and the nature of his employment, whether on extra or contract work, and any materials sent to other works, each individual workman making a return to him on a printed form provided for the purpose. The timekeepers collect the names of the ganger's men employed at occasional daywork, and count the number of men in each gang four times daily, and take an average as to the number employed for the day. One day is retained in hand from each man employed at daywork, until he is discharged, the wages being paid on the Saturday, although not for that day, but the Saturday preceding, counting from each Friday night.

I will, perhaps, better explain myself by giving, as it were, instructions to a set of men on a contract as to the manner they should adopt in keeping the accounts:—then as to the clerk, he is to debit the ganger's account, with the weekly men received, and enter to his credit the quantities and prices he is to have for his work; to fill up a weekly summary, showing how many men have been employed upon each separate description of work, and to render a perfectly separate account of day work. With respect to payments, he is to pay no task man without express sanction of superintendent, and to pay no day man except on a Saturday, unless he discharge himself entirely from the works, when he is to pay the back day kept in hand. He is to receive the invoices after they are examined by the foreman, whose duty it is to receive the goods. The invoices to be filed until the monthly or quarterly bills are delivered for examination. The invoices are to be copied into the day book, materials sent to or received from other works to be entered in books expressly for that purpose, bricks, lime and sand will be kept in separate accounts, backed with the party's name who supplies each material. No goods to be sent by tradesmen without an order, and to have a return ticket on delivery, for both of which forms are provided. Timekeepers to deliver to the desk every evening, the correct time and name of every man employed at daywork; also daily, the name of every ganger, the number of men, where at work, and the description of work. Any claim by the ganger for daywork not to be allowed unless rendered to the office as the regular daymen, and he must apply for payment the next Saturday, as it will not be paid at a subsequent period; and his account for taskwork must be settled monthly.

The superintendent lets and measures the works, and is responsible for the levels, and he is in fact the whole executive, the contractor being the capitalist or speculator. In the preceding account, no notice is taken of truck system, tommy shops, menage shops, or subsist money, or any of the tricks of contractors without capital, or such as those would be sure to have the lowest estimate; but the proceedings of a wealthy and reputable contractor are recorded, and from having seen service in both camps, I can bear testimony as to the good effects, both morally and physically, of the latter method of proceeding. The facility now given to contractors of keeping accounts open for an indefinite time, would be much checked, if engineers would not certify contracts completed, until the contractors previously lodged with them copies of all their extra claims.

With respect to measurement of works in progress, the various tables published by M'Neil, Day, Bidder, and the prismoidal formula, &c., are perfectly inapplicable, from the broken nature of the ground, it assuming shapes so various and uncouth at the different benches, gullets and levels; it is, therefore, necessary to take the dimensions on the ground, and by computation, ascertain the cubic contents. A considerable difference of opinion exists as to the modes of so doing, some using the decimal, and others the duodecimal measures; the former gives the contents in yards by multiplication, and the latter gives greater facility for the application of practice, or the division by aliquot parts; and the total can easily be converted into yards by dividing the number of cubic feet in a yard. In the one case, all dimensions are taken in feet and inches, and in the other, they are taken by a yard and decimal parts, the yard being divided decimally into a hundred divisions; this latter method is most used by old practitioners: but feet and inches are now being more used than formerly. The dimensions are recorded in two columns; one for the length, breadth, and depth, placed one over the other always in the same succession: the other column being left for the cubic contents of each dimension as it is squared, so as to make the addition of the several items into a total more easy. The dimensions of finished cuttings are taken at each chain's length, by a line stretched across on the natural surface of the ground, and a staff held in the centre, by an assistant, and a mean of the two ends taken for the depth. The width is measured half way up each slope in the centre of each chain. The length is measured along the centre of the cutting. The dimensions of each hole in broken work is taken similarly, but is recorded as only on account, and at a subsequent measurement it is retaken from a certain fixed point or chain in the section, which the measurement book will tell if kept on a uniform plan.

In making the monthly return of work executed, all previous measurements are annulled in toto; and the return made is the total quantity done, and not that that is done between each measurement. When a work is very rugged, it is usual to take the measurement of the embankment, and not the cutting, on account of the fewer dimensions. The cuttings are measured generally every fortnight, the intervening time being subsist weeks, when the pay is on account, from the timekeeper's return; and in some cases the number of wagons are computed as a check. The persons who act as timekeepers, are generally of the class that has seen better days; the excavators are a migratory horde, they are a collection of the agricultural labourers, who are more spirited than their fellow-countrymen, and who have left their native locality to better their condition; so that in works of this sort, trusting too much to the honour of such men will not do; and the more checks there are the better, or one stands the chance of knowing experimentally the meaning of the term "sloping," which by this time is fully known in France.

I have said nothing as to the mode in which the directors, engineer, and secretary, keep a check on each other; I think, however, that it is done by a system of sub-committees of finance, and the division of the line into districts, and that no monies are paid by the banker without the signatures of three of the directors and the secretary; being on an analogous plan to that adopted in olden times by corpo-

rate bodies—"The wardens each to have a key and a chest with three locks, and each to keep a key." I hope some one who has had a seat at the board will supply the information, as also the form of each printed paper used in each department—say engineer's department, printed forms for return of number of men, specification of rails, and general specification for works, number of yards done on each contract, return for each subdivision of the line, and schedule of prices, and tickets of return for materials received, and letter heads. In superintendent of line, a pass book for free riding on the service of the company, memorandum of coaching department, code of signals, instructions and duties of guards, general regulations for police, superintendent, inspectors, constables, switchmen and gatekeepers; instructions for the use of signal flags. Police department, return of train before or after time, number of engine, name of driver, number and description of carriages, trucks, wagons, horse boxes, and inspectors' remarks, and occurrences at the different stations, viz., number of coaches of 1st, 2nd, or 3rd class, and carriage trucks, vans, wagons, and mails leaving each station and left behind; also, a return of the name of upper guard, whether delayed by passengers or water, with the time of arrival, when due and despatched from each station. There are also a return of absentees, whose wages are suspended, viz., number of column, name, quality, where stationed, and cause of absence, and amount of wages. In addition to the above related departments, there are the printed time tables, and the ticket system; of colours for the different classes, and whether going east, west, north, to notice the returns or accounts rendered by police, when a line is south, or on the up or down trains.

In conclusion, the mention of defalcations must not be omitted that have taken place in the staff of the companies, which have amounted to upwards of six cases, and those invariably in the secretary's department; and in no one case am I aware that they have been brought to trial. The engineers generally come in for the greatest share of odium when works are unsuccessful, but I think the blame ought to be divided between the solicitor, secretary, and other officers, or the committee, which is indefinite enough. The engineer is of necessity obliged to be somewhat acquainted with his business, as influence and patronage will not so exclusively prevail as in other departments. I have known a line of railway where a quondam director slid into the office of superintendent, with £500 a-year; he was originally a druggist, having a seat at the board, which the sub-engineer had not; he was enabled to coerce him to do his duty, with no extra pay, he was a fluent speaker, and often saved the directors from attack; he could not, however, retain his ground, and both he and the body of directors acted shabbily to their employees, and illegally to their employers, the unfortunate shareholders. I may go on for some time longer, but am afraid of the editorial pruning hook; so for the present, conclude.

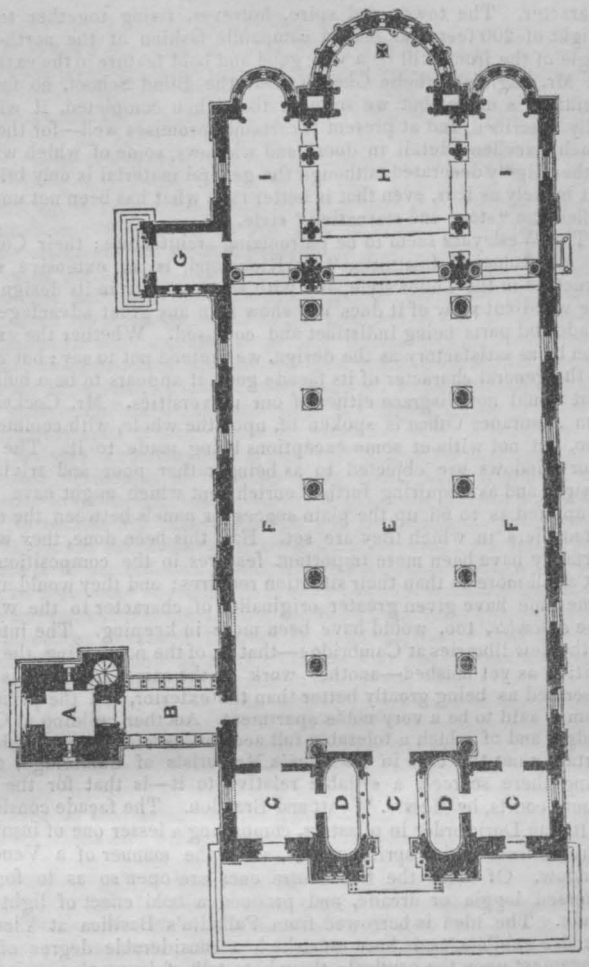
St. Ann's, Newcastle-on-Tyne. O. T.

REVIEWS.

COMPANION TO THE ALMANAC, FOR 1843.

On returning to this publication, we might dispense with prefatory remark; nevertheless, we have one to make by way of suggestion to its publishers, viz., that as they must now afford materials enough for the purpose, were all the architectural chapters from the commencement of the series collected together and reprinted, with such alterations and additions as might be found requisite, they would form a very useful and convenient volume—one that would to a certain extent serve as a Pocket Companion and Architectural Guide to the Tourist. As a sequence to this suggestion, we will venture another to publishers abroad, which is, that an "*Annuaire*" of new buildings, &c., for France and Germany—one for each country—is a desideratum.

Messrs. Wyatt and Brandon here make their début in the "Companion," with some éclat; there being three different buildings by them, and one of them very superior for a building of the kind, although—perhaps it would be nearer the truth to say *because*—it is in that picturesque style the Lombardic, against which, however, the Camden Society folks object, because, forsooth, it is not sufficiently "Christian" for their strait laced notions, upon matters that are purely conventional, and have nothing whatever to do with genuine religion. To object—otherwise than as taste is concerned, against the abandonment of the usages observed by our Roman Catholic builders, is surely ultra-squeamishness, after we have abandoned Romanism itself, with its idle pomposity and all its trumpery. Puseyism and Camdenism seem to have of late completely turned some people's brains. Instead of entering into frivolous, hair-splitting objections, we are well content with Wilton Church, on its own architectural merits, which are no ordinary ones; for while the exterior is strikingly picturesque in composition and design, the interior will, when completed, be quite a model of its kind—simple, yet beautiful and varied in its plan, and tasteful in its decorations; and not only with much to produce effect, but with nothing to counteract it, for there will be no galleries—at least no side galleries—which always give a sort of play-house look to a church; and which, even if capable of being so treated, never are made architectural in appearance, but always so as to cut up and encumber. Still, it must be confessed, that galleries accord very well with Professor Hosking's principle, that in churches "the largest number of persons must be brought within the smallest space!"—it is a wonder he did not add, "and at the cheapest rate." The three apses at the altar end of Wilton Church will be filled with stained glass, and for the further decoration of those recesses, which contribute so much to effect, it is in contemplation to paint their ceilings or semi-domes in fresco, but whether with subjects, or merely ornamental compositions as in the Temple Church, is not stated. Even the strait-laced "Ecclesiologist," though it protests against "the introduction of a foreign style in church architecture," as an evil that ought to be put a stop to at once, allows that Wilton Church is at least "good of its sort." Almost the only other church with regard to which the Companion enters into description, is the one now building by Mr. Poynter, in Broadway, Westminster, in the style of the later period of early English. Its internal dimensions are about 95 by 51 feet, exclusive of a spacious apsis at the east end; but as there are, unfortunately, to be galleries, we fear we must not anticipate any great excellence of architectural



Ground Plan of Wilton Church.

References.—A, Campanile, 17 feet square, 100 high, or extreme height about 120. B, Cloister. C C C, Entrances. D D, Staircases to Children's Gallery. E, Nave, 72 by 24 feet and 54 high. F F, Ailes. G, Vestry. H, Chancel. I I, Ailes to ditto. Extreme length, externally, 156 feet; internally, 127. Breadth, internally, 56 feet.

character. The tower and spire, however, rising together to the height of 200 feet, and placed campanile fashion at the north-west angle of the front, will be a very good and bold feature in the exterior. Of Mr. Pugin's Catholic Church, near the Blind School, no further mention is made, but we suppose that when completed, it will be fully described, and at present it certainly promises well—for there is much excellent detail in doors and windows, some of which will be rather highly decorated, although the general material is only brick—but homely as it is, even that is better than what has been not unaptly called the "stone and starvation" style.

The Wesleyans seem to be patronizing architecture; their College or "Theological Institution" at Richmond, is an extensive stone structure in the Tudor style, and with some novelty in its design; but the wood-cut view of it does not show it to any great advantage, the shadowed parts being indistinct and confused. Whether the execution be as satisfactory as the design, we pretend not to say; but as far as the general character of its façade goes, it appears to be a building that would not disgrace either of our universities. Mr. Cockerell's Sun Assurance Office is spoken of, upon the whole, with commendation, yet not without some exceptions being made to it. The first floor windows are objected to as being rather poor and trivial in design, and as requiring further enrichment which might have been so applied as to fill up the plain spaces or panels between the rusticated piers in which they are set. Had this been done, they would certainly have been more important features in the composition, but not at all more so than their situation requires; and they would at the same time have given greater originality of character to the whole. The *ensemble*, too, would have been more in keeping. The interior of the new libraries at Cambridge—that is, of the north wing, the only portion as yet finished—another work by the same architect, is also described as being greatly better than the exterior, and the principal room is said to be a very noble apartment. Another building at Cambridge, and of which a tolerably full account is here given—which is certainly not the case in Le Keux's Memorials of Cambridge, there being there scarcely a syllable relative to it—is that for the new county courts, by Messrs. Wyatt and Brandon. The façade consists of an Italian Doric order in pilasters, comprising a lesser one of insulated columns from which spring arches, after the manner of a Venetian window. Of these the five centre ones are open so as to form a recessed loggia or arcade, and produce a bold effect of light and shade. The idea is borrowed from Palladio's Basilica at Vicenza, but also exhibits, as is here remarked, a considerable degree of improvement upon the original; though, to talk of improving upon anything by Palladio, that may seem little less than treason to those who hold his works to be the *ne plus ultra* of refined taste. Of the "Brunswick Buildings" at Liverpool, some account was given in our last volume, at page 278, therefore we need here say no more than that the view in the Companion fully bears out the description of it, and shows it to be an exceedingly handsome piece of architecture.

Under the head of "Railways of Great Britain" we have a brief record of the progress of railways since Nov. 1, 1841, by which it appears that, from that time to the present, there is a total extent of 176¾ miles more brought into operation.

An Encyclopædia of Architecture, Historical, Theoretical, and Practical. By JOSEPH GWILT. Illustrated by more than 1000 engravings on wood. In one thick volume, 8vo, 1089 pp. London, 1842. Longman & Co.

As one of a series of similar works devoted to separate branches of study, and which has been stamped by public favour, and as a useful and economic compendium for the student, this Encyclopædia will, no doubt, prove a successful publication. Its contents, however, are so multifarious, some of them bearing upon matters which are but very remotely connected with architecture properly so termed, that it is to this last department we must confine ourselves for the present. And we begin by remarking that one great disadvantage attending works of the kind is that, however satisfactorily they are executed, as regards their main purpose, namely, the instructing those who have yet to learn, they are apt to disappoint those who are already familiar with the subject treated of, and of course acquainted beforehand with the substance of the information thus collected together. Allowance must, therefore, be made for want of novelty, since the whole ground must be gone over again, and novelty can be displayed only in the writer's views and opinions, and in his corrections of or additions to what has previously been said by others. We must, accordingly, restrict our observations to the architectural portion of the work, but to those opinions thrown out in it, which come immediately from Mr. Gwilt as their author; for it is these alone that can be made to serve as characteristic specimens, in a mere notice like the present, of so extensive a work.

One thing which is clearly enough apparent is, that Mr. Gwilt has not written *ad captandum*, at least not as far as the profession are concerned, for he expresses himself more than once by no means very encouragingly in regard to the present state of the art in this country, especially as compared with what it is in France. We do not quarrel with him for uttering such opinion, unpleasant as it may be, provided it be uttered in sincerity; but it is to be regretted that, as he has not scrupled to make so severe an allegation, he did not also allege some of the grounds on which it is formed. Possibly he may mean, not that there is greater architectural talent in France, but that greater and more frequent opportunities are afforded it in that country than in our own, where, according to him, it is rather checked than encouraged by the government;—which qualification would have softened the asperity of the censure. Very far be it from us to object to the expression of censure, for it is that which gives value to praise, and which produces improvement by holding up faults for correction; still we do not exactly approve of that species of it which deals in such vague generalities that it is hardly possible to meet and combat it. We own that too many opportunities are made mere jobs of in this country—that interest and favouritism too frequently supersede merit, and that false economy, which often turns out in the end to be very expensive, sadly maims many of our public undertakings in architecture; but we are also of opinion that there is talent among us that would fully vindicate our national reputation in art, were it but drawn out, or rather permitted to display itself uncramped, or even with some tolerable degree of freedom. When we look at what has been done in various parts of the country within the last few years, we perceive, upon the whole, improvement—certainly no falling off, and with regard to ability in Gothic architecture, we stand very far superior to any of our continental neighbours.

We do not dissent, however, very much from Mr. Gwilt, when he tells us that "the splendour of the government offices in this country, seems to be in an inverse ratio from the renown of the department;" in instance of which he refers us to the Admiralty and the "Treasury jumble of buildings;" to which he might have added the Custom House—a most miserable affair in point of architecture, and also the Mint, which has no merit, certainly not that of character, to recommend it. It is notorious that his opinion of the National Gallery is the reverse of favourable, as is likewise that which he entertains of the London University; nor do we suppose that he thinks very highly of either the Post-office, or the British Museum, for though he has not expressly censured, neither has he expressly excepted them from the rest. But it is rather, we trust, with reference to the past than to the immediate present, that there is or henceforth will be room for complaining of the indifference betrayed on the part of the government and those in power, towards architecture and the other fine arts. Something like a public voice in their behalf has lately made itself heard amidst all the never-ceasing din and squabbling of politics, and the daily palavering of the public press. The erection of such a noble fabric as the new Houses of Parliament will at least wipe off some of the reproach justly incurred by many other structures, national in their purposes, though of the nation most unworthy; and it may further be anticipated, that the schemes in contemplation for its internal embellishment, will give a powerful and lasting impulse to other branches of art. We will not risk our credit by predictions that may possibly be falsified by the event: fresco-painting may not succeed here, as far as by success is meant the satisfying public expectation and public taste; but it is a good augury, *ad interim*, that any discussion on the subject of it should have been treated as matter of public interest.

There is no difficulty in interpreting Mr. Gwilt's "expressive silence" in regard to Buckingham Palace, in the section devoted to that class of buildings, more especially as he is exceedingly chary indeed of any thing like praise towards another structure, which some have thought they could not extol too magniloquently. "We regret," he says, "that in this country we can offer no model of a palace for the student. Windsor Castle, with all its beauties, which, however, consist more in site and scenery than in the disposition of a palace, will not assist us." Ungracious and captious as this opinion may appear to many, it does not at all shock us. What we object to is, not the opinion itself, but to the *ipse dixit* tone in which it is uttered, without explanation on the part of the writer, so that we are at a loss to know what it is he most objects to in it; whether it be the plan and arrangement chiefly, or the style and the design.[1] We almost suspect

[1] As neither Mr. Poynter nor Mr. Britton has attempted to enter into a critical examination of the edifice as it came from Sir Jeffrey's hands—

that it is to these last he objects, and that he is disposed to class Sir Jeffry Wyatville with another "incompetent architect," for he has omitted his name as well as that of Wilkins in his list of architects, as he has likewise that of James Wyatt; which omissions cannot have been other than intentional, and are therefore peculiarly significant. However lightly we may now estimate him, James Wyatt is most indisputably an historic name in the annals of English architecture, and very far less of a mere shadow and *nominis umbra*, than some of those who are registered and catalogued by the historiographers of art, and of whom there is very little more than their dates to record. The name of Schinkel ought to have been inserted, unless the list was actually printed before his death was known in this country, which as it comes nearly at the end of the volume, we can hardly suppose to have been the case. We are aware that Schinkel is no favourite of Mr. Gwilt's; but favourite or not, his fame has spread throughout Europe; and if names so distinguished are to be omitted at pleasure, we may perhaps, ere long, see that of Palladio expunged from a table of eminent architects.[2] At any rate the precedent is an unfortunate one.

It cannot be expected that we should pretend to go regularly through a work so comprehensive, or have as yet thoroughly examined it; therefore—for the present at least—our readers must be content with our pointing out some of the passages and remarks which we noted in looking over the work. Among them are some which hit hard at the new Royal Exchange, animadverting on the want of judgment manifested, in leaving that portion of it which is intended for the Exchange itself, uncovered; which, however, he admits to be a matter of taste; "for if our merchants prefer exposure to the inclemency of the seasons, it is not our business to complain of their fancy." But that is not all; for after speaking of the Bourse at Paris, as an excellent model for buildings of that class, he adds, "the merchants and city of London disgrace themselves by allowing [only] £150,000 for a similar purpose here; and even for this sum they cut up their building into little slices, to reimburse themselves by rents for the miserable outlay. So much for the spirit and liberality of the British merchant!" Though that spirit will most assuredly not obtain for its writer the freedom of the city of London, or any other civic honours, we freely vote it our approbation, since we must own that, compared with the flourishing promises that bid us look for a structure worthy of the first commercial city in the world, the Royal Exchange has sunk down into insignificance.[3]

With equal justice do the Church Commissioners come in for a very severe reprimand from Mr. Gwilt, who, in one place, says, "if ever a death blow was aimed at the art, that was done by the commissioners for building the recent new churches;" and in another, he talks of "true honest churches, one whereof is better than a host of the brick Cockney-Gothic things that are at present patronized, wherein the congregations are crammed to suffocation and not accommodated." It is, indeed, mortifying to reflect that although they have afforded employment to numbers in the profession, the buildings alluded to have not at all benefitted architecture itself.

But what shall we say of the severe strictures at page 642, on the present modes of architectural drawing, which contain so much for consideration that they would afford us matter for a separate paper? That in both exhibition and competition designs there is, now-a-days, an affectation of powerful pictorial display, by means of meretricious colouring, exaggerated and unnatural shadows and tricky effects—amounting sometimes to downright falsification, cannot be denied, and is likewise to be deprecated as an abuse, because it imposes on the eye, and draws away the judgment from a sober examination of the design itself. Yet while we deprecate the abuse, we are not quite disposed to go along with Mr. Gwilt into the other extreme, and forbid not colouring alone, but shadowing also. Very far, indeed, too, are we from being of opinion that architectural drawing has deteriorated since the time of Jones, Wren, and Vanbrugh; for we should as soon think of saying that architectural engraving has declined since the days of Holler. That Mr. Gwilt is perfectly sincere in what he says, cannot for a moment be doubted; for, though he may be aware that they are not likely to be very popular, he utters his sentiments not only without disguise, but in a tone sufficiently emphatic; for instance, —"the greatest curse that in these days has fallen on architecture, is the employment of draughtsmen, who, with their trumpery colouring and violent effects, mislead the silly men and common-place critics that usually decide upon the merits of their works." This is severe enough, nor is it entirely free from prejudice—a little overcharged, perhaps, both in opinion and expression, therefore Mr. Gwilt must not be very much surprised if some should attempt to retaliate, and charge him with making use of very coarse language; be that as it may, we ourselves do not like his work the less for its occasional pungency of expression, which, even when we dissent from the sentiment, is more to our taste than the smirking, wishy-washy style of many other writers.

The more practical part of the work contains a great deal of information—of course not entirely fresh, and therefore more or less familiar to professional men; but it renders this Encyclopædia a complete elementary course for the student, affording him, in a single volume, the instruction that he must else gather for himself from a variety of publications. Still, it is questionable whether it would not have been more advisable to publish some of the sections separately, in the form of a supplement to be bound up with the rest by those who choose to take it, because so much matter of that kind, incorporated as it now is in the volume, may deter not a few from becoming purchasers.

(To be continued.)

Ancient and Modern Architecture. Edited by M. JULES GAILHABAUD. London: Firmin Didot, and Co. Part 3.

Another part of this excellent work has appeared, which is fully equal in interest to the former numbers; it contains a rich specimen of the Lombard style, the Carthusian Church near Pavia, Italy: the façade is covered with most elaborate ornament, which is shown in detail in another plate. The third plate is a view of the Cathedral of Bonn, in Germany, a fine specimen of the Norman style; the principal elements, however, present in general, the characteristics of the modified Byzantine style, but not so pure as that style. The eastern apsis, with its two towers, seem to belong to the close of the eleventh century or the beginning of the twelfth. This edifice contains some excellent points, from which the architect may glean with advantage, and turn to good account for some of our new churches. We know of no work that will add so much to the taste of the architect as the one before us.

Turning and Mechanical Manipulation. By CHARLES HOLTZAPFFEL, A. Inst. C. E. Vol. I. London: Holtzapffel & Co., 1843.

We have been able only to give a cursory glance at this work, but from what we have seen, we have no hesitation in pronouncing it to be a work of the highest use, both to the practical man and the amateur. Next month we shall return to it.

SEWERS OF THE METROPOLIS.

WE are heartily glad that some agitation has taken place on this subject, having been introduced by the Poor Law Commissioners. We are sorry that we cannot insert Mr. Donaldson's defence, as chairman of the Westminster Commissioners, but we hope to advert to it next month; for although we do not agree with Mr. Chadwick in many points, we strongly hold that the present system of sewer administration is susceptible of improvement, so as greatly to relieve the proprietor and builder, and induce parties to construct sewers who now shrink from such a responsibility.

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perhaps, because their opinion of it is no better than Mr. Gwilt's—we shall probably take up the subject ourselves.

[2] The omission of such names is all the more extraordinary, because that of Brettingham is inserted, notwithstanding the discredit attached to it even by Mr. G. himself, who remarks that he had the unparalleled assurance to send out to the world as his own, Kent's Designs for the Earl of Leicester's seat at Holkham—a contemptible and dirty trick, but not an unparalleled one in the history of architectural publications.

[3] Since shops there must be, the very least that can now be done is to take care that they shall be as little obtrusive in appearance as possible, to which end prohibitory clauses ought to be introduced into the leases, forbidding not only show-boards, but all display of articles at the windows, where only blinds should be allowed, with the names and business of the respective tenants painted on them. This could not be complained of, because the restrictions would be imposed alike upon every one, and no one is compelled to become a tenant if he should object to the conditions.

NOTES OF THE MONTH.

THE new Law Courts in Guildhall-yard are to be immediately erected from the designs of Mr. Tite, F. R. S. The elevation next to Guildhall-yard is to be in the Gothic style, and the buildings on the opposite side, now occupied as the Guildhall Police Office, &c., are, it is said, to be re-fronted, to correspond in appearance. Guildhall Chapel formerly occupied the site of the Law Courts, and the style of that edifice might well be used in the present design; at the same time we sincerely hope that the style of Guildhall front will not be adopted, but that the present opportunity will be taken advantage of to get rid of the cocked-hats and other barbarisms which Master Dance was pleased to call Gothic, and which we should call *Gothic par excellence!* Several of the Common Council have advocated such a course, and we hope will persevere.

The ground for the new Conservative Club, in St. James-street is cleared of the buildings upon it, and shows a frontage of 150 feet. The building, it is expected, will be commenced in the ensuing spring, from the joint design of Mr. Sydney Smirke and Mr. Basevi.

The restoration of Wells Cathedral has been entrusted by the Dean and Chapter to Mr. Cockerell, R. A., and it is at present to be confined to the choir and organ.

The Temple Church is fast approaching completion. The floor is being covered with inlaid tiles, manufactured by Messrs. Minton, of Staffordshire. Next month we hope to be able to give some account of the restorations.

The Lycian marbles discovered at Xanthus by Mr. Fellowes have arrived at the British Museum, and their public exhibition is awaited with much anxiety on account of the merit they possess. We have before expressed our opinion that much of value connected with Persian art remains to be discovered, and recent discoveries in the East tend to confirm this. The remains of Persian art which have as yet reached Europe, show a promise of something better than we have yet had, and illustrate the influence of Persia on Greek art, of which abundant evidence is shown in the Lycian marbles.

On the Travellers' Club a new attic is being raised, so as to relieve the garden-front now swamped by the Reform Club and Athenæum. The addition is in the same chaste style as the rest of the building. The only part which is looked upon with doubt is the inhersion of telescopic circular windows in the roof. The interior is to be decorated by Sang, a German artist, with arabesques, and used as a smoking-room. In reference to Barry's application of colour we have heard some remarks upon the decoration of the groined arcade at the Travellers' Club. This he has had painted in imitation of granite, thus appearing to violate probability, as it would be difficult to work granite in such a way.

The Noah's Ark on the top of the Mansion House has at last been removed, to the great satisfaction of the public.

Cateaton-street is rapidly advancing, and will make a fine street. Guildhall is, as we have announced, to be improved. St. Lawrence Jewry and Gresham Hall abut upon the street. The latter building is to have a highly decorated front, in the florid Italian style, of four Corinthian pilasters. It is by far too small for the purposes to which it is to be devoted.

The widening of Fetter-lane, at the Fleet-street end, is determined upon, and the houses have been removed.

Mr. Barry's works in Trafalgar-square now begin to show themselves. The shaft of Mr. Railton's Nelson column is nearly completed, and the bronze capital which is being cast at Woolwich is in an advanced state.

A new Hall and Library are to be built in Lincoln's-inn, from the designs of Mr. Hardwicke, and are, we understand, to be in the style of the old parts of Hampton Court.

We have seen a line engraving of Barry, by Hurland, which is in private circulation; it is 8 inches by 6½ inches, and beautifully executed, but we do not consider it a striking likeness.

METROPOLITAN IMPROVEMENTS.

Whitehall, November 30th.—The Queen has been pleased to appoint the Earl of Lincoln, Lord Lyttleton, Lord Colborne, the Right Hon. James Charles Herries, the Right Hon. the Lord Mayor of the city of London, Sir Robert Harry Inglis, Bart., Sir Charles Lemon, Bart., Henry Thomas Hope, Esq., Henry Gally Knight, Esq., Alexander Milne, Esq., the Hon. Charles Gore, Sir Robert Smirke, Knt., and Charles Barry, Esq., to be Her Majesty's Commissioners for inquiring into and considering the most effectual means of improving the metropolis, and of providing increased facilities of communication within the same. The Queen has also been pleased to appoint Trenham Walshman Philipps, Esq., to be Secretary to the said Commission.

IRON STEAM VESSELS.

SIR—The writer of a paper on steam navigation in the November number of the *Journal* says, "The iron of which vessels are composed has been found to become brittle in the course of years, so that, although tough at first, it will, in the course of time, star like glass, when struck by a hard and sharp body." May I be allowed to remark that some of the friends of iron ship-building are startled by the assertion contained in this sentence, and would be glad to know whether the author of it can point to any instance of such "starring" which has actually taken place. Until this can be done, the examples of the *Aaron Manby*, which is stated in the same number of the *Journal* to have been at work from 1822 to 1830, without requiring any repairs, although she had been *repeatedly aground* in the Seine, *with her cargo on board*, and which vessel is also stated to be *now* at work,—of the steamer built by the Horseley Company for the Shannon, in 1825, and now "in good order," and of other iron vessels, do not appear to favour very strongly the serious objection raised against iron vessels in the paper quoted above.

I am, respectfully,

Neath, 12th mo. 10th, 1842. A. M.

[The objection alluded to by our correspondent is very well known to exist, by those whose acquaintance with the working of iron steam vessels is the most extended. In the *Lady Lansdown* iron steamer on the Shannon, the effect of a collision when the vessel was new was merely to indent the plate; after the vessel had been at work for some time, a tendency was observed in the plate to crack, as well as to become indented, and the brittleness of the plate was found to increase as the vessel became older, until, when struck by a hard and sharp body, it starred in the manner we formerly stated. Whether this effect is due to the action of the water or to the tremor occasioned by the engine, we do not pretend to determine; if the latter, steam vessels of moderate power may undergo a less rapid deterioration, and something of the superior durability of the *Aaron Manby* may possibly be owing to the smallness of that vessel's power.—ED.]

MEDHURST'S WATER VALVE.

SIR—Excuse my troubling you with the following remarks:—

I have been much surprised by repeatedly seeing reference made to a water valve invented by Mr. Medhurst, and particularly a description of it by Mr. Vignoles in his lecture in Cornwall, reported lately in the *Railway Times*, where he remarks that it is a very ingenious contrivance, the only objection being that the country the railway passes through must be perfectly level—a serious objection certainly, but not the only one; for the learned Professor surely cannot be so unacquainted with the principle of the common pump as not to know that when the tube is exhausted of air, the water will rush in to supply its place, and so render the tube ineffectual. Another objection is that the communication between the piston and carriage being on one side only, the pipe must necessarily be on one side also—a very unmechanical contrivance, to say the best of it. The chances of the water freezing, or rusting of the piston, are left quite out of the question.

A YOUNG MECHANIC.

CONTRIVANCE FOR DESTROYING SMOKE.

SIR—At a meeting held at the Leeds Music Hall about ten months ago, I had the pleasure of examining a variety of models and drawings of patented smoke-consuming apparatus; also of hearing the same explained by the inventors thereof, or by their representatives. Previous to this meeting, I had paid little or no attention to "smoke burning," as it is commonly termed, but since, I have done quite to the contrary; I have been continually on the listen, and in full expectation to see from an individual, whose signature has occasionally appeared in your pages, a contrivance to effect the object in question more agreeable to my fancy than any I had seen. My expectation in this respect not being realised, and perceiving from a printed notice received from the Leeds Board of Works, about three weeks ago, that the period is fast approaching when all the "wholesale smoke manufacturers" within the borough of Leeds will, by Act of Parliament, be compelled to check, to a great extent, that nuisance which has been so long complained of, I began to think it high time to do something by way of experiment to diminish the periodical dense volume which rolled from my own chimney-top.

During the last three or four months, I have had frequent opportunities of witnessing the operation of several different kinds of apparatus for consuming smoke, some of them patented and some not; the whole of which I found wanting some improvement to render them capable of accomplishing their intended purpose still more effectually. This circumstance caused me to try a plan of my own, the success of which has induced me to hand you the present communication. After all the discussion and bother that has of late been *driven* up and down the country concerning the consumption of smoke, "smoke burning" is, nevertheless, in my humble opinion, as far as Englishmen have been enabled to succeed in the *science*, attended with so little difficulty as to be accomplished with very little trouble and expense. My furnace was recently one of the ordinary description, though it is now entitled to the name of a "smoke-burner," and the difference of the state in which it now is, and that which it formerly was, is simply this.

Cold air being admitted through a regulating door or valve built in the wall on one side of the ash pit, into a space or chamber formed within the wall which supports the fire-bridge, ascends through a narrow aperture extending across the top of the bridge, that is from one side of the boiler to the other into the flue, where it mingles, with the smoke, and thas renders combustion more complete. The air thus admitted into the flue can have no good effect any longer than it assists combustion; for this reason, if the engine man be a little attentive, he will generally find that the air valve may be shut in about four minutes after each renewal of the fire.

There are many "smoke burners" now in constant operation in this neighbourhood, some few of them appear to answer tolerably well, while others, *of the very same plan*, appear to have no effect whatever. This circumstance renders it impossible for a stranger to distinguish the chimneys which have "smoke burners" attached to them, from those which have not. I do not mean to say the plan I here describe is a perfect remedy for preventing the smoke of chimneys; it is such as I am convinced will protect me against any interference of the Leeds improvement commissioners; it has a better effect in accomplishing its object than a great majority of those in the neighbourhood; and it is inferior to none I have yet witnessed, except in one point, and that is of all others the most important, viz. *expence*.

From your humble servant,

Near Leeds, Nov. 29, 1842. FLEECE.

[We did not think it necessary to give the drawing forwarded by our correspondent, as we consider that the description will be sufficiently understood without it; this "smoke burner" is, we believe, identically the same as one that was patented some years since, which patent has expired.—ED.]

BLAST ENGINES.

SIR—I shall feel obliged by an explanation from you or from some of your correspondents in an early number of your valuable *Journal*, of the following irregularity of *blast* from a blast engine.

The engine blows four furnaces, three on one side, and one on the other side. There are two receivers, one exactly opposite to the gable of the engine house, into which the air is first forced, and another situated nearly equidistant from the three furnaces on one side of the engine. The blast to the three furnaces is taken from the bottom of the receiver at the engine house, and to the other furnaces, within a short space of the top, and about one foot above the orifice through which the blast passes from the engine to the receiver. I applied a mercurial gauge to various parts of the pipe leading to the single furnace, and I found the pressure varying irregularly from a quarter to three and a half pounds on the square inch; whereas the pressure on the pipes leading to the three furnaces kept uniformly three and a half pounds.

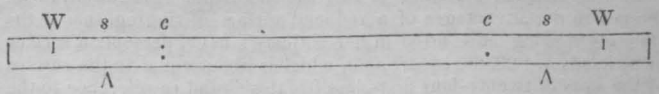
I am, Sir,
Your most obedient servant,

Clyde Iron Works, Glasgow, WILLIAM FERRIE.
December 27, 1842.

ON THE STRENGTH OF BEAMS.

SIR—The above sketch shows the situation of the supports, &c., of a cast iron beam I lately had an occasion to make use of for carrying a load of about seven tons at each end. The distance between the supports *s*, *s*, was six times as great as that between the centre of each load, W, and the nearest support.

Now, I should feel myself highly obliged if some of your scientific readers would be kind enough to furnish the *Journal* with a correct method of shaping beams of this class; also the best formula for computing their strength. To prove where a beam of this kind would break, I took a parallel square bar of cast iron, divided its length, and placed it upon two supports, as seen in the sketch, then



submitted it to a pressure, acting equally upon the points, W, W, till it broke in the points *c*, *c*. Was I not to infer from this circumstance, that beams of the present kind require to be made strongest between the points of support? Query—Would this inference be consistent with theory? I don't remember seeing in any author on the subject, any satisfactory information relating to this class of bearers; still it is a form which in general practice is often found very convenient: and I have no doubt that if some of your able correspondents would give the subject a thorough investigation, the result thereof would be generally received as being of great practical importance.

Leeds, Dec. 17, 1842. CONCRETE.

OBSTRUCTIONS TO WINDOWS.

SIR—I have repeatedly endeavoured to obtain definite information on the subject of obstructions to windows (which have acquired a right by being opened upon adjoining property the requisite length of time) but having been unable to obtain any thing to be relied on, perhaps you, or some of your numerous and well informed correspondents can afford light on the following subjects.

1. Suppose a window to be opened upon an adjoining property, and (by neglect of the owner of such adjoining property) to acquire a right to remain open. What space of ground is required to be left open for its use, say in a direct line from its face, or the face of the wall in which it is built or opened?

2. Does the opening such window (of course it being possessed of the right as above) give any right to space on each side, or more than its own width.

3. Does it preclude the building of any structure beneath it, or as high as its sill.

These queries, you will perceive, are intended to cover all the ground of right of occupancy inherent in [windows, which have been allowed to remain open a length of time sufficient to give what is termed a right of light.

By replying to the above, or giving it a place in your valuable journal,

You will oblige,

West Derby, Dec. 5, 1842. AN OLD SUBSCRIBER.

[We rather suspect that our correspondent will find some difficulty in obtaining a satisfactory answer to his queries, 1 and 2; we believe that there has not been any defined distance settled. At a trial, much depends upon the hard swearing of witnesses on both sides, as to whether a building erected near a window does obstruct the light and free circulation of air. After hearing of evidence, it is left to the Judge and Jury who may try the cause to determine the point. In answer to the third query, there is no doubt that the owner of the soil has a right to build beneath the window or as high as the sill; if in London, the roof must be 18 inches below or from the opening, to conform to the building act.—ED.]

SMITH'S PATENT WIRE ROPE.

AT the Society of Arts, on Wednesday, the 14th December, a paper by Mr. A. Smith was read, "*On the properties of Wire, as applied in the Manufacture of Rope for Mining and Railway Purposes, Standing Rigging, Lightning Conductors, Cables, &c.*" After some preliminary remarks on the increment of strength, as compared with diminution of bulk, resulting from the processes of drawing and annealing the wire, Mr. Smith gave a table of the strength of single wires of various gauges, the breaking weights having been obtained by experiment with the testing machine. This was followed by a table of tests of the comparative strengths of the Government hempen-rope, and Mr. Smith's wire-rope, from experiments ordered by the Admiralty in March, 1837. Another table gave the comparative size, with the weight, and cost per fathom, of iron-wire rope, hempen-rope,

and chain of equal strength. The general results are, that standing rigging of wire-rope, of equal strength with the hempen-rope, one-third of the size and half the weight, may be fitted at about two-thirds of the cost.

In the nautical statistics of Mr. Smith's paper it is stated, in reference to the advantages of a reduced surface of rigging, that "the standing rigging now fitted in her Majesty's navy, presents a surface of upwards of 800,000 square feet, which is about equal to the surface of the sails of twenty-four first-class frigates;" and in reference to the disadvantages of the absorption of moisture by the hempen-rope, that "one fathom of hempen-rope, about three inches in circumference, will absorb half a pound weight of water, and will contract one inch in length. The standing and running rigging of a first-rate measures about 30,000 fathoms, and will, consequently when wet, contract in length, on an average, about 880 yards, or nearly half a mile, and will absorb about seven tons of water, which, being principally carried aloft, will materially affect her sailing," &c.

Mr. Smith explained the construction of an apparatus termed a "screw lanyard," which he substitutes for the ordinary lanyards and dead-eyes of the shrouds, for the purpose of tightening the wire-rope rigging. It consists of a piece of Russell's wrought-iron tubing, with a screw at each end, working in right and left screw sockets.

The ship's lightning conductor is described as a copper-wire rope, securely fitted to the trucks and mast-head caps, and descending from the top-gallant and top-masts down the rigging, and over the ship's side, where it is inserted in a copper-plate, in contact with the sheathing below the water-line, &c.

On Wednesday, the 21st of December, Mr. Smith continued his communication. He commenced by explaining the tenacity and elasticity of various metals, and experimented by a testing machine on wires of platina, gold, silver, copper, and iron. He first tried a piece of platina wire, twelve inches in length, $\frac{1}{16}$ inch in diameter, and weighing 8 dwts. 5 grs; this experiment, however, failed from an accident. The gold wire, of the same length and size, (weight 5 dwts. 10 grs.) broke at 384 lbs.; silver, same size and length (weight 4 dwts. 14 grs.), broke at 260 lbs; copper, (3 dwts. 12 grs.) broke at 180 lbs.; and iron, 3 dwts., at 310 lbs. A copper rod, one-fourth of an inch in diameter, was then tested, which withstood a tenison of 2,000 lbs.; and an iron one, of the same diameter, did not break until a power was applied equal to upwards of 3,000 lbs. A wire bridge, of 33 feet span, was erected in the room, the construction of which Mr. Smith explained. The wire rope, forming its principal support, weighed 56 lbs.; the angle-irons, 112 lbs.; and the other parts, including the braces, 56 lbs.; and 112 lbs. for the platform or footpath, composed of boards —thus making the whole weight only three cwt., and which might be completed by four men, in about three days, at a cost not exceeding 15*l.*, and could, at any time, be taken down or put up in half an hour. These descriptions of bridges were described as very useful for military purposes, and for throwing over deep cuttings in railways, &c., Mr. Smith stated, that for general practical purposes the cost might be taken at 1*l.* per foot run, with a breadth of three feet. Two smaller models of bridges, on different principles of construction, were also shown.

KEENE'S MARBLE CEMENT.

At the Society of Arts a paper was lately read by Mr. White, "*On Keene's Marble Cement.*" It is described as a combination of sulphate of lime and alum. The gypsum undergoes the same preparation as for plaster of Paris, being deprived of its water of crystallisation by baking. It is then steeped in a saturated solution of alum, and this compound, when recalcined and reduced to a powder, is in a fit state for use. The cement has been extensively applied as a stucco, but the finer qualities (when coloured by the simple process of fusing mineral colours in the water with which the cement powder is finally mixed for working) being susceptible of a high degree of polish, produce beautiful imitations of mosaic, and other inlaid marbles, scagliola, &c. The cement is not adapted to hydraulic purposes, or for exposure to the weather, but has been used as a stucco in the internal decorations of Windsor and Buckingham Palaces. From its extreme hardness, it has been found serviceable when used for imbedding and setting the tiles of tesselated pavements, &c., and has been adopted for this purpose at the French Protestant Church, the new fire-proof chambers in Shorter's-court, and the Reform Club House. In the course of the discussion which followed, Mr. C. H. Smith and Mr. Lee adverted to the extreme hardness of the cement as its principal recommendation, when applied as stucco and for mouldings.

[We have seen some of the imitations of mosaic and inlaid marbles referred to in the above paper; we can say, and truly, that the beautiful, and in point of polish superior to scagliola; we have also seen some fine specimens of granite, imitations in plinths for halls, chimney-pieces, columns, pilasters, &c.; and we must not forget to mention the imitation statuary mouldings, with polychrome ornaments, after the Greek. For the purposes of interior ornament, we consider this cement a great acquisition to the architect. We, therefore, strongly recommend the profession to visit Messrs. White's works, where may be seen various applications of the cement for decorative architecture, particularly two table tops, containiug several imitations of rare marbles.]

THE SILLOMETER, DERIVOMETER, SUB-MARINE THERMOMETER, AND STEAM-ENGINE INDICATOR, OF M. CLEMENT.

At the request of a subscriber to give some information relative to M. Clement's Nautical instruments, for which Government lately made a grant, we make the following extracts from the *Mechanics' Magazine*:—

1. The *Sillometer* is the title given to a substitute for the common log, which has been recently invented by a M. Clement, of Rochfort, and is so well thought of by the French Admiralty, that it has been ordered to be forthwith supplied to the different ships of the Royal Navy of France. It is a most ingeniously constructed instrument, and promises to be of great practical utility. To describe it as well as we can in words:—

A hollow copper ball, against which the water acts, is attached to a moveable plug of the same metal, which slides in a copper tube that passes through the centre of the vessel to the keel; to this plug is attached a lever, which, by means of a vertical rod, acts on a second lever placed on the deck of the vessel, and communicating with a spring; the tension of the spring constitutes an equilibrium with the pressure of the water on the ball, and serves to measure the rate at which the ship is moving, by means of a hand, the movements of which on a graduated dial, indicate, at every movement, not only the speed of the ship, but also the distance run in any given time.

2. The second invention is called a *Derivometer;* it is an instrument to ascertain a ship's leeway, and is moved by a paddle, that may be placed under the keel at will, and is supported by a plug sliding in a tube like that of the Sillometer, but turning with the paddle and the rod. The motion is transmitted from the paddle and rod to two semi-circular dials, one of which indicates the leeway to larboard, the other to starboard. When at anchor, the instrument will show clearly the direction of the currents.

3. The third invention is a Sub-marine Thermometer. It appears from the thermometrical observations of many scientific navigators, that in seas of unfathomable depth, the water is not so cold as over banks, and that over banks near the shore it is less cold than over those at a greater distance, but colder than in the open sea. M. Clement's thermometer is kept constantly under water at the same depth, and indicates the different temperatures of the water by means of a dial placed on the deck of the vessel, and always open to examination. The immediate action is communicated by wheels, the working of which turns two hands upon the dial, the one marking the single degrees, and the other the tens. The whole is enclosed in a tube attached to the side of the vessel, and the helix of the apparatus is at the lowest part of the tube, in immediate contact with the water, and always at the same height.

4. The fourth invention consists of an instrument which indicates constantly the elasticity of the steam both in high and low-pressure engines, and the level also of the water in the boilers. The instrument may also be applied to the piston of an engine, so as to show the loss of power sustained by the steam in its way to it. A tube, similar to the manometer, is affixed to the instrument through which the steam ascends, and is introduced into a copper or brass box placed on the deck of the vessel, and upon which a graduated dial indicates, by means of a hand, to the officer of the watch, the effects of the engine, without his having to send below to ascertain it.

M. Clement has obtained patents for these different inventions both in France and this country.

The following experiments made by order of the Lords of the Admiralty on board of the *Lightning* steamer, we extract from the Government report.

"*Thursday, October* 13, 1842.

"About one mile and a quarter below Gravesend commenced a trial between Massey's patent log and M. Clement's sillometer. After a run of two hours and a half (being off Sheerness)—

	Miles.
"Distance given by Massey's log . . .	$15\frac{1}{10}$
"Distance given by sillometer . . .	15
"Distance from the Nore Light to Deal by sillometer	42
"Distance by tables	$41\frac{3}{4}$

"At 25 minutes past 4 o'clock, P.M., altered the course four points, during which operation the sillometer showed a diminution of speed from 8 miles per hour to 7 miles. At 50 minutes past 8 o'clock P.M., off South Foreland, commenced a trial between Massey's log and the sillometer.

"On Friday morning took in Massey's log, and found the distance from abreast the South Foreland to about 7 miles to the eastward of the Owers—

by Massey's log 84¾ miles; by sillometer 82½; by tables 85 miles. Moved sundry weights aft, viz., boat, brass guns, anchors, oars, &c.: for an instant the speed, as shown by the sillometer, diminished to 7·4 miles per hour, but it almost immediately increased to the former speed of 8 miles per hour. Moved the same weights forward, but could not perceive any sensible difference in the speed of the vessel. The speed, as shown by the sillometer, varied from 8·1 to 8·2 miles per hour. Tried the speed of the vessel by the common log, which gave 8¼ miles. The sillometer indicated exactly the same. At 10 o'clock, A.M., on Friday, when about two miles past the Nab Light, tried Massey's log, and found the distance to near the entrance of Portsmouth harbour—by Massey's log six miles nearly; by sillometer six miles exactly. During the passage round to Portsmouth, the speed of the vessel was purposely checked, by blowing off the steam, to see the effect on the sillometer. The speed, as shown by that instrument, was gradually reduced from eight miles per hour to four miles, at which point it stood steady. On the order being given for full speed, the sillometer showed a gradual increase of speed, till it came to 8 miles per hour, as before. On the return of the *Lightning* from Portsmouth to Woolwich, the distance performed was found to be—by Massey's log 119 miles; by the sillometer 118·6.

"The sillometer has a dial upon deck, which constantly shows the number of miles per hour that the vessel is going; consequently it is easy to discover, under all circumstances, what is the best trim of the vessel, and the most advantageous quantity and distribution of the sails for obtaining the greatest speed. As the sillometer shows immediately the effect which every alteration in the sails or trim of the ship has on its velocity, it follows, also, that ships fitted with the sillometer can constantly maintain the speed they may have agreed upon, and so keep company together, and maintain the same relative position, though, from the darkness of the night, or thickness of the weather, they cannot see each other. To ascertain the distance run after any number of hours, it is simply to take the number of minutes one of the watches of the sillometer has gained over the other, and to multiply that number by six, which gives the distance run in miles.

"*The Marine Thermometer.*—The trials with this instrument on board the *Lightning*, commenced at 11 o'clock on Thursday morning, October 13, previous to leaving Woolwich harbour, and on taking the centigrade, it was found to be 12°. At 25 minutes past three o'clock P.M., in five fathom channel, cant-shoal, depth of water about 16 feet, it indicated 13·25°. In 23 feet depth of water, as stated by the pilot, it indicated 15·25°; off Dover 16°; and in Portsmouth harbour, 14·2. From these indications it appears that the marine thermometer in its variations followed the inequalities of the bottom of the sea, so far as these inequalities could be ascertained from the heaving of the lead, or from the information of the pilot—that is, on the aproach of shoal water the thermometer fell, and on the approach of deep water it rose, and distinguished the difference very distinctly and rapidly, according to the transition from shallow to deep water, and *vice versâ*. It may, therefore, be inferred that the marine thermometer would indicate the approach to rocks and icebergs, from the influence these bodies are known to have on the temperature of the sea for a considerable distance." The dial of the marine thermometer is also on deck, and shows, by inspection merely, the exact depth of water in which the vessel may be sailing at the time.

SUNDERLAND HARBOUR FLOATING DOCK.—Application is intended to be made in the ensuing Parliament for an act to authorise the Wear Commissioners to convert the lower part of the Tidal Harbour of Sunderland into a Floating Dock, by a course of dams, piers of masonry, with navigable gates between, across the River Wear. The works are intended to confine or impound seven feet of water above the low water-mark of the average spring tides in this part of the harbour; 100 acres of water will thus be rendered available to shipping, producing at Pallion a depth of five feet in the Channel, and at the Folly End an average depth of 12 feet. Facilities for moving ships in and out of loading berths, and increased accommodation for ships of a larger class, will thus be secured. The navigable gates to be each 80 feet in width of opening, with sluices or slackers in them for letting off the water when required. These gates are proposed to be left open till three hours after high water, or until the water has ebbed out to the height above specified. Ample time will, therefore, be given for ships passing outwards. The gates are to remain closed until the tide has again flowed to the level of the confined water, of three hours flood, when the tidal water will force them open, and the navigation of the stream will again proceed as at present. It is also proposed to construct a Tidal Dock or Basin, to contain 25 sail of vessels, for the purpose of having an entrance to the great Dock always available. Mr. Murray, the Commissioner's engineer, has prepared the necessary plans for the intended works. The Parliamentary plans have been lodged.

THE NEW BARRACKS AT PRESTON.—We understand that the plans and specifications for the new barracks at Fulwood, near Preston, have at length passed, and received the confirmation of the Hon. Board of Ordnance. They will be on the most magnificent and complete scale, superior to any in the kingdom, to accommodate 2,000 men, with stabling for 750 horses.—*Preston Chronicle.*

INSTITUTION OF CIVIL ENGINEERS.

THE COUNCIL of the Institution of Civil Engineers have awarded the following TELFORD and WALKER Premiums for 1842.

Robert Thomas Atkinson, M. Inst. C. E., for his Paper "On the sinking and tubbing, or coffering of Pits, as practised in the Coal Districts of the North of England," a Telford Medal in Silver, and Books.

William Cotton, for his "Memoir of Captain Huddart," a Telford Medal in Silver.

Chevalier Frederik Willem Conrad, for his "History of the Canal of Katwyk, (Holland,) with an Account of the Principal Works upon it," a Telford Medal in Silver.

James John Wilkinson, for his "Historical Account of the various kinds of Sheathing for Vessels," a Telford Medal in Silver.

Thomas Casebourne, M. Inst. C. E., for his "Description and Drawings of part of the Works of the Ulster Canal," a Telford Premium of Books.

Thomas Girdwood Hardie, Assoc. Inst. C. E., for his "Description and Drawings of an Iron Work in South Wales," a Telford Premium of Books.

Charles Nixon, Assoc. Inst. C. E., for his "Description and Drawings of part of the Tunnels on the Great Western Railway," a Walker Premium of Books.

Alexander James Adie, for his "Descriptions and Drawings of the Bridges on the Preston and Bolton Railway," a Walker Premium of Books.

John Brannis Birch, Grad. Inst. C. E., for his "Description and Drawings of the Bridge at Kingston-on-Thames," a Walker Premium of Books.

Robert Richardson, Grad. Inst. C. E., for his "Description and Drawings of part of the Works of the London Docks," a Walker Premium of Books.

James Combe, Assoc. Inst. C. E. for his "Description and Drawings of Messrs. Marshall's new Flax Mill, at Leeds," a Walker Premium of Books.

Charles Denroche, Grad. Inst. C. E., for his "Description and Drawings of the Apparatus used for Compressing Gas, for the purposes of Illumination, &c.," a Walker Premium of Books.

Adrian Stephens, for his "Description of the Explosion of a Steam Boiler at the Penydarran Iron Works, South Wales," a Walker Premium of Books.

George Ellis, Grad. Inst. C. E., for the Drawings illustrating the "Description, Specification, and Estimates of the Calder Viaduct, on the Wishaw and Coltness Railway; with the Series of Experiments on the deflection of Trussed Timber Beams for that work, by John Macneill, M. Inst. C. E.," a Walker Premium of Books.

Thomas Chalmers, Grad. Inst. C. E., for the Drawings illustrating the "Report on the Sinking of two experimental Brick Cylinders, in an attempt to form a Tunnel across the River Thames, by John Isaac Hawkins, M. Inst. C. E." a Walker Premium of Books.

THE NILE.

The following account of the plans adopted by Mehemet Ali for carrying into execution the improvements of the Nile, first conceived by the Emperor Napoleon, is transmitted to Paris by Dr. Labot, who arrived lately in Egypt. The first great work is to be the establishment of a bridge of 83 arches, running from the point of the Delta to each of the opposite banks of both branches, similar to the Pont-Neuf at Paris. On each side of the spur, a sluice is to be formed for the purpose of Navigation. All the 83 arches are also to be furnished with flood-gates of iron or wood, to be opened or shut, according to the wants of traffic and navigation. A tunnel is to be cut through the spur of the Delta, forming a communication between the two branches of the river. Canals are also to be cut from each branch running to the east and the west, with various minor channels, with sluices for the commerce and irrigation of the country. Above the bridge, the Nile is to be embanked on each side, so as to keep the water always within a certain level. All these embankments will be faced with masonry to give to them solidity and beauty. Concrete will be used for all the submarine works, and the rest will be done with squared stone, rubble, and bricks. These materials are found in abundance in Egypt, and even in the immediate neighbourhood of the works. Artificial pozzolano is in general use, being obtainable in all parts of the country from pulverised bricks. This matter, which is analogous to that produced by volcanos, being mixed with lime and rubble, form what is called beton or concrete. Before the discovery of this pozzolano, which costs 5 fr. the cubic metre on the spot, it was formerly brought from Italy, at the expense of 45 fr. or 50 fr. the cubic metre. The cost of the bridge has been estimated at 7,000,000 fr., and cannot exceed 10,000,000 fr. When once the materials are collected, it will require no more than three years for 5000 men to complete this colossal undertaking, which will vie in grandeur with the celebrated monuments of ancient Egypt. According to a calculation recently made by a Parisian engineer, it appears that the present irrigation of Egypt, though very limited in comparison to what will now be accomplished, costs the labour of 200,000 oxen and 100,000 men.

MISCELLANEA.

THE TOMB OF NAPOLEON.—The construction of the tomb of the Emperor Napoleon is about to be commenced, and for the last few days a model of the work has been exposed to public view at the Invalides. An equestrian statue of the Emperor is to be placed in the middle of the great court, and on the pedestal will be represented the arrival of his ashes at the place where they now lie. The entrance of the crypt destined to receive the Emperor's mortal remains will be ornamented on each side by two gigantic statues and two lions couchant. This entrance will be surmounted with an altar on spiral columns. The present grand altar and its rich canopy must be removed to admit of this arrangement.

THE TUILERIES AND THE LOUVRE.—The *Globe* notices a rumour, that during the next session of the Chambers the plan for uniting the palaces of the Tuileries and the Louvre by a screen, resembling in architecture the façade front of the Quay de Louvre, and thus forming one of the finest squares in Europe, will be presented. The centre will, it is said, according to this project, be ornamented with an equestrian statue of the Duke of Orleans, and the works are to be entrusted to the direction of the Civil List. The expense to be divided into thirds: one to be borne by the Civil List—one by the State—and the last by the city, to be laid out in embellishments. If this project be adopted, the idea of purchasing the site bounded by the Pont-Neuf, the Quais d'Horloge and des Orfevres, and the Rue du Harlay will be relinquished, and the new wing or screen of the Louvre will be appropriated to the Royal library.

THE NEW CORN EXCHANGE, GLASGOW.—The spacious and beautiful hall which has been erected in Hope-street as a Corn Exchange, for the accommodation of those engaged in the grain trade, was opened on Wednesday 23rd November, for the first time, when the respective stalls were taken possession of by their tenants, and a good deal of business transacted. As this building, independent altogether of the important object it is destined to serve, is an ornament of a very high order to that part of the city in which it has been erected, we deem it worthy of a special notice. The exterior is finely relieved by a handsome range of Roman windows, and is decorated all round the top with a massive balustrade, while the entrance which fronts Hope-street, is adorned with a beautiful portico, formed of Corinthian columns, 25 feet in height, finished with a corresponding entablature and pediment. The front has been designed in a style of great chasteness and purity, the work executed with much skill, and the entire building presents a noble and imposing appearance. The hall within is exceedingly spacious, and has a very striking aspect, being of a construction altogether different from that of any other building in the city. It is entirely lighted from cupolas tastefully introduced into the panels of the ceiling, and ornamented by a magnificent lantern light 50 feet by 30, formed in the centre of the building, and supported by eight columns, fluted, and ornamented in the Corinthian style. The dimensions of the hall are 80 feet by 57; the height of the ceiling 22 feet; and, viewed as a whole, it has an exceedingly light and elegant appearance. There have been erected round the hall 36 stalls for the grain merchants, so formed as to give facilities for exposing their samples, for writing, and otherwise carrying on business. They are let at the rate of 10*l.* each per annum, and we understand that 31 of them have already been taken, the name of each tenant being painted on his stall. Underneath the hall, which is reached by a short flight of stairs from the pavement, is a large grain store, perfectly capable of containing nearly 800 tons of grain. The building, so creditable to the parties chiefly connected with the grain trade, with whom it originated, has been built by subscription shares of 50*l.*; and the speculation bids fair for being a very profitable one. The architects are Messrs. Brown and Carrick, who, throughout the whole details, have manifested a degree of taste, skill, and ability, which cannot fail to add to their reputation.—*Glasgow Chronicle.*

STATUE OF THE QUEEN AT EDINBURGH.—A colossal statue of Her Majesty Queen Victoria, is now being executed in freestone, by Mr. Steell, sculptor, and which is to be placed in the north front of the Royal Institution, Prince's-street. One stone is upwards of 22 tons weight: and was brought from the Binny Quarry to town on a wagon drawn by 16 powerful horses, assisted at certain difficult parts of the road by a number of Mr. Lhind's men. It was safely lodged in a large wooden building, Bread-street, where Mr. Steell is already far advanced in the formation of this gigantic structure, and which, when completed, will weigh altogether upwards of 90 tons. From the well known talents of the artist, the beauty and solidity of the Binny stone, and the commanding situation it is to occupy, this statue of our beloved Sovereign cannot fail to be an object of great attraction, and will complete the beauty of the splendid building it is intended to adorn.

ARCHITECTURAL REMAINS IN ASIA.—The *Commerce* states, that "most favourable news had been received from M. Tessier, appointed to direct the expedition sent to Magnesia, in Asia Minor, in order to raise the remains of the temple of Diana Leucophica. It appears that many more objects had been discovered than was originally expected, amongst others several columns in complete preservation, with their capitals sculptured with extreme delicacy, besides 12 bas-reliefs admirably executed, and a number of statues. The most friendly aid had been afforded by the French authorities in the Levant, and it is expected that a brilliant harvest is being reaped for the Academy des Beaux Arts at Paris."

THE NEW ROYAL EXCHANGE.—Notices have been given by the city authorities for pulling down the mass of building in front of the Bank (known as Bank-buildings) in the course of the spring, and the space, when cleared, is to be the site for the statue of the Duke of Wellington, immediately in front of the great portico of the Exchange. The progress made in the building itself is most astonishingly great, reflecting the highest credit upon Mr. Tite, the architect, and Mr. Jackson, the contractor. In the course of this year the work will be in great forwardness, and it will certainly be finished in the summer of the following year. The sculpture of the pediment Mr. Westmacot undertakes to complete by the 1st of May, 1844.

TIMBER TANK.—A wrought iron cylinder, 51 feet long and 6 feet diameter has been erected in Portsmouth Dock Yard, for the purpose of "Burnettizing" timber under pressure. It is composed of plates half an inch thick, and double rivetted, and the ends are of cast iron, with doors 2 feet 6 inches square, for the admission of logs. It is fitted with two air pumps of 14 inches diameter, for extracting the air, and two force pumps for increasing the pressure when filled with the solution. On a trial lately made before the Admiralty engineer Mr. Kingston, the cylinder having been charged with 20 loads of timber, the air pumps which are arranged to be driven by Lord Dundonald's rotary engine, were set to work, and a vacuum of 26½ inches was obtained in 30 minutes. A cock in the connecting pipe was then opened, and the solution rushed into the vacuum from the cistern. When the cylinder was filled with the solution, the force pumps were set to work and the pressure was raised to 200 lb. on the square inch. Under this pressure there was not the slighest leakage from any part of the cylinder, nor from the doors. The timber was removed on the following day, and a log was cut up, when it was found that the solution had penetrated to the very centre, and completely saturated it. The pressure at which the apparatus is in future to be worked, is 100 lb. on the square inch, as this is found to be sufficient for the due saturation of the timber within 24 hours, under the process of previous exhaustion of the air. The whole of the work was executed by Messrs. W. Fairbairn and Co., of London, and the cylinder rivetted up by their patent rivetting machine, to which its great tightness may be attributed.

NEW IRON STEAMER, "THE MAGICIAN."—An iron vessel, of 360 tons burthen, built by Messrs. Ditchburn and Mair, with engines of 110 horse power, by Messrs. Penn and Son, and fitted with Morgan's patent wheels, tubular boilers, and Howard's cooling apparatus, was tried during last month, and has proved to be a first-rate steamer; in point of speed she is not to be excelled. The following account of experiments we extract from the Woolwich correspondent of the *Times*:—The experiments were made on the 16th, 17th, and 18th of November. The vessel left Woolwich about ten o'clock a.m.. on the 16th, and in about half an hour afterwards passed the *Rhadamanthus*, which had left Woolwich at nine o'clock. At about half-past 11 o'clock she stopped for a few minutes at Gravesend, and then proceeded with a strong breeze ahead, and adverse tide, and at a quarter past one o'clock passed the Nore-light vessel; arrived at Ramsgate at 25 minutes past four o'clock, when the weather was so severe, that none of the London steam vessels arrived during the course of day. The weather continued so boisterous during the 17th, that the *Widgeon* steam-vessel was under the necessity of putting into Ramsgate harbour at an early hour for shelter. The *Magician*, however, left Ramsgate shortly after 11 o'clock, a.m., the wind blowing at the same time a strong breeze from the eastward, and at 53 minutes past 12 o'clock passed Dover Pier, with a very heavy sea running. At 24 minutes past one o'clock, when opposite Folkstone, she put back for Ramsgate, where she arrived at 44 minutes past three o'clock. On the 18th the *Magician* left Ramsgate at 17 minutes past ten o'clock, a.m., with flood tide, and at 14 minutes past three o'clock, p.m., arrived off Woolwich. The average speed of the engines from Ramsgate to Woolwich was 35¼ revolutions per minute, length of stroke three feet six inches, height of steam gauge seven inches, height of barometer 28¼ inches. The boilers are constructed on the tubular principle, very small, and generate steam well. The consumption of coal was about 6lb. per horse-power per hour, and the vessel was found to be extremely easy and dry in a heavy sea. The average speed of the vessel from Ramsgate to Woolwich, the distance being estimated at 85 miles, in five hours, was equal to 14 knots, or 17 statute miles per hour.

DOVER.—Few persons are perhaps aware that our harbour commissioners have determined upon making the most extensive alterations and improvements for widening and generally enlarging the harbour; so extensive, no doubt, as to leave it beyond a matter of question that the Government intend making Dover harbour one of refuge. All the "old buildiugs," including the Dover Castle Inn, Amherst Battery, and the warehouses and buildings occupied by Messrs. Gilbee, Norwood, Spice, Dennis, Clarke, and others, are to be pulled down, and their sites thrown iuto the harbour. The whole of Union street also is to come down, with the exception of Messrs. Latham's Bank and the York Hotel. The railway will clear away Beech-street, the whole of the South Pier houses, and a part of Seven-star-street, which will include nearly all the shipwrights in Dover, not even excepting Mr. Duke, whose residance will also come down. These changes must have an extraordinary effect on all the trades of Dover, who will speedily be called into action for the purpose of supplying the "houseless wanderers" with places wherein to hide their heads.—*Dover Telegraph.*

New Locomotive Engine—"The Man of Kent."—Messrs. Rennie have turned out another locomotive that promises to excel the "Satellite," sent out by the same firm about 12 months since, and which has been working on the Brighton Railway with so much satisfaction and economy, the average consumption of coke being not more than 20 lbs. per mile, with a train of eight or nine carriages. It lately performed the distance from Croydon to Brighton, 40½ miles, with six carriages, in 52 minutes, including three stoppages of three minutes each, which deducted, make the actual time running only 43 minutes. During the whole period of 12 months it has been running not one shilling has been laid out for repairs. "The Man of Kent" promises even to excel these excellent qualities of the "Satellite;" it is a splendid specimen of engineering work, and possesses several improvements; among others is an important one of encasing the cylinders, which are 15 inches diameter, with a jacket, which will always be kept charged with hot steam; a second improvement, is the introduction of a damper, so constructed, that the apertures of the tubes next the smoke-box may be wholly or partially eclipsed simply by the driver turning a handle, which regulates the draft of the engine to the greatest nicety; a third improvement is in the regulator, which is generally circular consequently difficult to keep tight—it is now a slide valve. The centre of gravity is kept down by the spring being below instead of above the axles, as usual. We hope next month to be able to give some account of its performance.

South Eastern Railway Works.—The stupendous works now proceeding for the formation of the South Eastern Railway between Dover and Folkstone are rapidly progressing, and extensive preparations are making to throw down a large portion of Rounddown cliff, just beyond the Shakespeare tunnel, to make way for the sea wall. During last month experiments were made by the miners below the cliffs, under the superintendence of Lieut. Hutchinson, and General Pasley is expected to be present at the grand operation; this blast is to be effected by the enormous charge of 18,000 lbs. of gunpowder; it will be exploded by the electric spark from a galvanic battery, carried by conductors 1,000 yards in length. The experiments have hitherto been quite satisfactory, and it is expected at once to dislodge a portion of the cliff many tens of thousands of tons in weight.

Comparative Cost of English and Foreign Railways.—In Mr. Robert Stephenson's elaborate and important report, addressed to the directors of the South Eastern Railway, on the system of railways, as now projected by the French government, he gives an analysis of the cost of railways in England, selecting three lines—the Northern and Eastern, the York and North Midland, and the Birmingham and Derby—as cases similar in their results to those in France now under consideration; from this, and also an analysis of the cost both of the Belgian and French lines, it appears the average cost per mile of the English lines is 25,450*l.*, the French lines, 23,000*l.*, and the Belgian lines, 16,206*l.*; thus showing a difference in the cost in favour of the Belgian lines over the English of no less a sum than 9,244*l.* per mile, and over the French of 6,794*l.*

Burning Lens worked by the Drummond or Oxy-Hydrogen Light.—A colossal burning lens, three feet in diameter, and weighing 5 cwt., has been erected in the Royal Adelaide Gallery, intended to be worked by the Drummond, or oxy-hydrogen light. Some private experiments of this power of the Drummond light have taken place, when it was found that the bulb of a differential thermometer introduced into the focus, at a distance of 16 ft., was sensibly affected, and a piece of phosphorus introduced in the same point was fused. It has long been asserted that the heat accompanying light obtained by artificial means does not produce heat capable of being transmitted and concentrated through lenses; these experiments fully prove the contrary.

Price of Gas.—Gas is manufactured in Manchester by the Commissioners of Police, and though sold at from 5*s.* to 6*s.* the 1,000 cubic feet, yields a revenue of 12,000*l.*, or 15,000*l.* per annum to the town. The large consumers pay 5*s.* the 1,000 feet. [In Dublin the charge, when burnt by meter, is 10*s.* the 1,000 feet, and the quality so inferior in illuminating power, as to require the holes in the burners to be about double the ordinary size. If our civic authorities would follow the example of the Manchester Commissioners, it might prevent the necessity for a burgh rate, and confer a boon on the gas consumers.]—*Dublin Advertiser.*

An Immense Block of Granite has been landed at Mr. Tuckvill's wharf, Greenwich; it is from the Haytor Company's quarries, Dartmoor; measuring 10 feet 6 inches square, and weighs 22 tons. It is to be used as a covering for a mausoleum in Kensal-green Cemetery.

Bell Rock Lighthouse.—During the late heavy gales which have done so much damage to shipping, particularly between the 19th and 23rd of October, the sea sprays appear, by the monthly returns from the Bell Rock Lighthouse, to have risen upon the building to the height of from 60 to 90 feet every tide. While this heavy sea ran, one of those great detached masses of stone familiar to the lightkeepers by the name of "Travellers," was forced across the rugged surface of the rock, about 100 yards to the lighthouse, where it destroyed part of the cast-iron landing wharf. This stone measured about 7 feet in length, 3½ feet in breadth, 2½ feet in thickness, and must have weighed about 4 tons. To prevent mischief by the movement of these great stones, the lightkeepers are provided with quarry tools, with which they broke it up and arrested its progress, but it was no easy task from the run of the sea. The heaviest seas which visit the Bell Rock are from the North-east, but the present gale was chiefly from the North-west; and it is not a little remarkable that the Frith of Forth was but little affected during this storm above the Island of May.

Quarrying Stones.—Another remarkable example of the contributions of science to the arts of life is derived from the properties of heat, as applied in the East to quarrying blocks of stone, when the object is to excavate huge blocks from the surrounding mass. A groove is cut some 2 inches in depth in the required direction; this done, the groove is filled with fuel, which is kept lighted until the rock is highly heated. The rock then is, of course, expanded by the action of the heat; the fuel is then swept away, and cold water immediately poured into the groove. The sudden contraction causes the block instantly to split off. The same principle is daily exhibited on our tables. If a heated glass be suddenly filled with cold water, it immediately breaks in pieces. In this way blocks 80 ft. long and 6 thick are easily taken off with no other labour than that of chiselling out the groove. A similar example of the application of science to the economy of power is exhibited in France in the quarrying of millstones. They are required, as you are well aware, to be circular and flat—cylinders with a very small altitude compared with the diameter—and the stone from which they are made is exceedingly hard. The mode of quarrying them is this:—A very high circular column of stone is wrought out of the requisite diameter. To slice off portions of this, such as are required by the common stone saw, would be a work of immense labour, a quite different agent is employed. At regular successive distances grooves are cut around the column, into which are driven dry wooden wedges at evening, The dew which falls during the night being absorbed by the wood, causes it to expand with a power so irresistible, that all the stones are found properly cracked off in the morning. —Dr. Lardner: *Lectures in the United States.*

Seyssel Asphalte.—Many of our readers, may remember that some years ago, and previously to the introduction of asphalte into this country, we expressed our admiration of the pavement, composed of that substance in Paris, and especially of that in the Place de la Concorde, the whole of which has been long since paved with asphalte. It now behoves us to point out the piece of Seyssel asphalte laid down in April, 1838, in Whitehall, opposite the Horse Guards, as equal to the pavement in the Place de la Concorde, or in any part of Paris, and considering that its thickness is only half an inch, its having so long stood the traffic of so great a thoroughfare without any apparent change, except a greater smoothness of surface, is very remarkable.—*Times.*

NOTICES ON THE STEAM ENGINE, &c., IN REPLY TO CORRESPONDENTS.

We have been requested to correct certain alleged errors in our review of the Appendix E, F, to Tredgold, given last month. In reference to the engines of the Dee and Solway, a Greenock correspondent says—"The air-pump rods are cased with gun metal, and the iron at the lower end is secured by a brass flange jointed and screwed to the bucket, so that no part of the iron is exposed to corrosion from the salt water. The upper and under portions of the D valves are connected with three rods. (Is the writer of that article aware that Maudslays have only *one rod* in the engines of the "Great Western") The holding down bolts were made as requested by the engineer appointed to inspect the engines."

Our readers will probably recollect that our objection to the air-pump rods of these engines was, that they were cased at all. We have known instances in which this casing stripped off, and have been informed that some such accident did actually occur to the engines of the Dee or Solway. The expedient referred to by our correspondent, of covering up the end of the rod with a brass flange will, we fear, go but a little way in obviating the corrosion to which we adverted, for it is not at the extreme end of the rod, but at the neck of the rod, where any injurious corrosion takes place. The water insinuates itself to a certain depth between the brass of the bucket-eye and the iron of the rod, and eats its way up beneath the casing. We have known air-pump rods to be rendered unserviceable by this species of corrosion, when their extreme ends were comparatively uninjured.

The allusion to the practice of Messrs. Maudslay is, we suppose, intended to show that our strictures were shallow and hypercritical. Upon this point we shall leave our readers to form their own opinions, and shall content ourselves with expressing our gratification that Messrs. Scott and Sinclair have relinquished their old system in favour of that which we have all along recommended. It forms no part of our function to inquire at whose instance the holding down bolts, or any other part of an engine have been constructed in an objectionable manner; our purpose is not to find fault with any one particular party, but merely to express our conviction that certain practices are bad, and ought to be exploded. We war not with individuals with errors.

Another Greenock correspondent informs us that the formula $45\left(\frac{1}{\theta}-\theta\right)$ given in the notes on "Steam Navigation" in our last month's number has been "altogether misapplied." because, indeed, we have alleged it to express "the rise or fall in temperature due to compression or rarefaction, without reference to initial density." Our correspondent favours us with an algebraic formula to prove his position, but our pages do not contain the allegation he charges upon them, we, therefore, think it needless to give the paper an insertion.

LIST OF NEW PATENTS.

GRANTED IN ENGLAND FROM NOVEMBER 25TH TO DECEMBER 22ND, 1842.

Six Months allowed for Enrolment, unless otherwise expressed.

Felix Napoleon Target, of Blackheath, gentleman, Leon Castelaine, of Backlane, Shadwell, chemist, and Adolphe Aubril, of Back-lane, aforesaid, artist, for "*a new method of refining or manufacturing sugar.*"—Sealed Nov. 25.

James Smith, of Coventry, card stamper, for "*improvements in weaving ribbons and other ornamented fabrics.*"—Nov. 25.

Charles Heard Wild, of Birmingham, engineer, for "*an improved mode of constructing floors for fire-proof buildings.*"—Nov. 25.

Isham Baggs, of Wharton-street, in the county of Middlesex, chemist, for "*improvements in producing light.*"—Nov. 25.

Frederick Oldfield Ward, of St. Martin's-lane, gentleman, and Mark Freeman, of Sutton, in the county of Surrey, gentleman, for "*improvements in candlesticks, apparatus, and instruments employed in the use of candles and rushlights.*—Nov. 25.

Pandia Theodore Ralli, of Finsbury-circus, wine-merchant, for "*improvements in the construction of railway and other carriages, and in apparatus connected therewith.*"—Nov. 25.

William Henry Fox Talbot, of Lacock Abbey, Wilts, Esq., for "*improvements in coating or covering metals with other metals.*"—Nov. 25.

Thomas Shansell, of Birmingham, agent, for "*certain improved machinery for cutting or shaping leather, paper, linen, lastings, silks, and other fabrics.*"—Dec. 3.

Ebenezer Timmis, of Birmingham, manufacturer, for "*improvements in apparatus used for arresting the progress of and extinguishing fire.*"—Dec. 3.

Edward Cobbold, of Melford, in the county of Suffolk, clerk, M.A., for "*improvements in instruments for writing or marking, part or parts of which improvements are applicable to brushes for water-colour drawing.*"—Dec. 3.

John Stubbins, of Nottingham, hosier, for "*improved combinations of machinery to be employed for manufacturing certain parts of articles in stocking or lace fabrics.*"—Dec. 3.

Don Pedro Pouchant of Glasgow, civil engineer, for "*a certain improvement or improvements in the construction of machinery for manufacturing sugar.*"—Dec. 3.

John Sealy, of Bridgwater, merchant, for "*an improved tile.*" Two months.—Dec. 3.

Charles Heard Wild, of Birmingham, engineer, for "*an improved switch for railway purposes.*"—Dec. 3.

Thomas Howard, of Hyde Chester, manufacturer, for "*improvements in machinery for preparing and spinning cotton, wool, flax, silk, and similar fibrous material.*"—Dec. 3.

William Hancock, Jun., of Amwell-street, gentleman, for "*improvements in bands, straps, and cards for driving machinery and other mechanical purposes.*"—Dec. 3.

Frederick William Etheredge, of Frindsbury, gentleman, for "*improvements in the manufacture of bricks, tiles, and other similar plastic substances.*"—Dec. 3.

William Henry Stuckey, of Guildford-street, Esq., for "*improvements in filtering water, and other fluids.*"—Dec. 3.

William Pope, of the Edgeware-road, ironmonger, for "*an improved stove.*"—Dec. 6.

William Oxley English, of Kingston-upon-Hull, distiller, for "*improvements in purifying spirits of turpentine, spirits of tar, and naphtha.*"—(A communication.)—Dec. 8.

William Coley Jones, of Vauxhall-terrace, practical chemist, and George Fergusson Wilson, of Vauxhall, gentleman, for "*improvements in operating upon certain organic bodies or substances, in order to obtain products or materials therefrom for the manufacture of candles and other purposes.*"—Dec. 8.

William Smith Harris and Septimus Hamels, both of Leicester, cotton-winders and copartners, for "*improvements in the manufacture of reels for reeling cotton and linen thread.*"—Dec. 8.

William Kempson, of the Borough of Leicester, manufacturer, for "*improvements in the manufacture of muffs, cuffs, ruffs, tippets, mantillas, pelerines, dressing gowns, boots, shoes, slippers, coats, cloaks, shawls, stocks, cravats, capes, boas, caps, bonnets, and trimmings for parts of dress.*"—Dec. 8.

George Purt, of St. Mary-at-Hill, soda water manufacturer, and William Hall of Woolwich, engineer, for "*improvements in producing aerated liquors.*"—Dec. 8.

Richard Barber, of Leicester, reel manufacturer, for "*improvements in the manufacture of boots, shoes, and clogs.*"—Dec. 8.

John George Bodmer, of Manchester, engineer, for "*improvements in the manufacture of metallic hoops and tyres for wheels, and in the method of fixing the same for use, and also improvements in the machinery or apparatus to be employed therein.*"—Dec. 8.

William Edward Newton, of Chancery-lane, civil engineer, for "*improvements in the construction and arrangement of axles and axletrees for carriages, carts, and other vehicles used on rail or other roads.*—(A communication.)—Dec. 8.

William Lomas, of Manchester, worsted-spinner, and Isaac Shimwell, of the same place, worsted-spinner, for "*improvements in the manufacture of fringes, cords, and other similar small wares, and also in the machinery or apparatus for producing the same.*"—Dec. 8.

John Grantham, of Liverpool, engineer, for "*improvements in the constructions and arrangements of the engines and their appendages for propelling vessels on water.*"—Dec. 8.

James Brown, of Soho, Birmingham, engineer, for "*improvements in steam engines and steam propelling machinery.*"—Dec. 8.

Benjamin Fothergill, of Manchester. machine-maker, for "*improvements in machines called mules, and other machines for spinning cotton, wool, and other fibrous substances.*"—Dec. 8.

Percival Moses Parsons, of Waterloo-road, Surry, civil engineer, for "*improvements in steam engines and boilers, and in motive machinery connected therewith.*"—Dec. 8.

Charles Keene, of New Bond-street, hosier, for "*improvements in the manufacture of hose, socks, drawers, gloves, mitts, caps, comforters, and cuffs.*"—Dec. 15.

William Palmer, of Sutton-street, Clerkenwell, manufacturer, for, "*improvement in the manufacture of candles.*"—Dec. 15.

Thomas Cardwell, of Bombay, in the East Indies, merchant, for "*improvements in the construction of presses for compressing cotton and other articles.*"—Dec. 15.

Moses Poole, of Lincolns-inn, gentleman, for "*improvements in dressing mill stones.*—(A communication.)—Dec. 15.

Charles Maurice Elizee Sautter, of Austin Friars, in the City of London, gentleman, for "*improvements in the manufacture of sulphuric acid.*"—(A communication.)—Dec. 15.

Guillaume Simon Richault, of the Subloniere Hotel, Leicester-square, editor of music, for "*improvements in apparatus for exercising the fingers of the human hand in order to facilitate their use in the playing of the piano forte and other instruments.*"—(A communication.)—Dec. 15.

James Winchester, of Noel-street, hatter, for "*improvements in steam boilers, and in the methods of applying steam or other power to locomotive purposes.*"—Dec. 15.

Edward Robert Rigby, and Charles John Rigby, of Gracechurch-street, brush manufacturers and copartners, for "*improvements in the manufacture of certain articles in which bristles have been or are now used.*"—Dec. 21.

Gabriel Hyppolyte Moreau, of Leicester-square, gentleman, for "*improvements in propelling vessels.*"—Dec. 21.

Gabriel Hippolyte Moreau, of Leicester-square, gentleman, for "*improvements in steam generators.*"—Dec. 21.

John Squire, of Ponghill, Cornwall, engineer, for "*improvements in steam boilers or generators.*"—Dec. 21.

Taverner John Miller, of Millbank-street, Westminster, oil merchant, for "*improvements in apparatus for supporting a person in bed. or when reclining.*"—Dec. 21.

William Bridges, of Birmingham, button-tool-maker, for "*improvements in buttons.*"—Dec. 21.

Henry Purser Vaile, late of Fleet-street, gentleman, for "*improvements in combining mechanical instruments for obtaining power.*"—Dec. 22.

Joseph Beaman, of Smethwick, Stafford, ironmaster, for "*an improvement in the manufacture of malleable iron.*"—Dec. 22.

William Godfrey Kneller, of Wimbledon, chemist, for "*improvements in the manufacture of soda in the evaporation of brine, and in the concentration and manufacture of sulphuric acid.*"—Dec. 22.

Robert Wilson, manager at the works of Messrs. Nasmyths Gaskell and Co., at Patricroft, near Manchester, engineer, for "*improvements in locomotive and other steam engines.*—Dec, 22.

James Morris, of Cateaton-street, merchant, for "*improvements in locomotive and other steam-engines.*"—Dec. 22.

THE VARIATION OF THE COMPASS.

Observations made at the Royal Observatory, Greenwich,

G. B. AIRY, Astronomer Royal.

Mean Magnetic Declination for the month of September, 1842—23° 14′ 11″

The observations of the Magnetic Dip are suspended, when they are resumed the results will be recorded as usual.

NEW HYDROSTATIC ENGINE.—At the Taff Vale Railway, we learn, by the *Cambrian*, that a very complete hydrostatic engine is now at work, for the raising and tipping of coal, to be shipped from the terminus of the Taff Vale Railway, at the Bute Docks, Cardiff. It is only just set to work, but exhibits the principle of the hydrostatic balance very beautifully, and with the most perfect practical results.